# APPENDIX C

# HUMAN HEALTH STREAMLINED RISK ASSESSMENT

## TABLES
## FIGURES
## ATTACHMENTS

# APPENDIX C

# HUMAN HEALTH STREAMLINED RISK ASSESSMENT

# TABLES

## Table C1-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 78, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| LF1-S01 | UB02433 | 27-Apr-1994 | 0 - 1 | Explosives, Metals, Pesticides, VOC, SVOC |
| LF1-S02 | UB02620 | 29-Apr-1994 | 0 - 1 | Explosives, Metals, Pesticides, VOC, SVOC |
| LF1-S04 | UB02413 | 26-Apr-1994 | 0 - 1 | Explosives, Metals, Pesticides, VOC, SVOC |

SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds

## Table C1-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 78, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Statistical Distribution | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 1.98E+04 | 3.12E+04 | NA | | | 1.63E+04 | 2.14E+04 | Y |
| Arsenic | 3 / 3 | 100 | 4.29E+00 | 8.76E+00 | NA | | | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 3 / 3 | 100 | 1.15E+02 | 1.82E+02 | NA | | | 1.24E+02 | 1.94E+02 | N (b) |
| Beryllium | 3 / 3 | 100 | 1.76E+00 | 3.16E+00 | NA | | | 8.00E-01 | 8.68E-01 | Y |
| Boron | 1 / 3 | 33 | 9.64E+00 | 9.64E+00 | 6.64E+00 | 6.64E+00 | | | | Y |
| Chromium | 3 / 3 | 100 | 2.24E+01 | 3.14E+01 | NA | | | 3.70E+01 | 6.44E+01 | N (a) |
| Cobalt | 3 / 3 | 100 | 6.11E+00 | 1.86E+01 | NA | | | 1.52E+01 | 3.25E+01 | N (b) |
| Copper | 3 / 3 | 100 | 1.86E+01 | 5.34E+01 | NA | | | 1.27E+01 | 2.25E+01 | Y |
| Iron | 3 / 3 | 100 | 5.44E+04 | 8.00E+04 | NA | | | 3.42E+04 | 5.54E+04 | Y |
| Lead | 3 / 3 | 100 | 1.58E+01 | 2.04E+01 | NA | | | 4.01E+01 | 6.38E+01 | N (a) |
| Magnesium | 3 / 3 | 100 | 1.86E+03 | 8.31E+03 | NA | | | 1.03E+03 | 9.60E+03 | N (b) |
| Manganese | 3 / 3 | 100 | 7.67E+01 | 1.65E+02 | NA | | | 1.58E+03 | 4.66E+03 | N (a) |
| Nickel | 3 / 3 | 100 | 1.39E+01 | 4.03E+01 | NA | | | 1.03E+01 | 2.00E+01 | Y |
| Potassium | 3 / 3 | 100 | 1.04E+03 | 1.97E+03 | NA | | | 8.00E+02 | 6.01E+03 | N (b) |
| Sodium | 3 / 3 | 100 | 1.06E+02 | 3.83E+02 | NA | | | 6.34E+02 | 5.63E+02 | N (a) |
| Vanadium | 3 / 3 | 100 | 3.73E+01 | 4.41E+01 | NA | | | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 3 / 3 | 100 | 3.69E+01 | 1.25E+02 | NA | | | 4.06E+01 | 7.37E+01 | Y |
| **Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 1 / 3 | 33 | 1.10E-02 | 1.10E-02 | 6.80E-02 | 6.80E-02 | | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Benzo(a)anthracene | 1 / 3 | 33 | 1.70E-01 | 1.70E-01 | 4.10E-02 | 4.10E-02 | | | | Y |
| Chrysene | 1 / 3 | 33 | 1.70E-01 | 1.70E-01 | 3.20E-02 | 3.20E-02 | | | | Y |
| Fluoranthene | 1 / 3 | 33 | 1.90E-01 | 1.90E-01 | 3.20E-02 | 3.20E-02 | | | | Y |
| Phenanthrene | 1 / 3 | 33 | 2.50E-01 | 2.50E-01 | 3.20E-02 | 3.20E-02 | | | | Y |
| Pyrene | 1 / 3 | 33 | 2.80E-01 | 2.80E-01 | 8.30E-02 | 8.30E-02 | | | | Y |

mg/kg = milligrams per kilogram
NA = not available
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Surface soil is defined as 0 to 1 foot below ground surface.
[b] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[d] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C1-3

## Selection of Chemicals of Potential Concern for Surface Soil[a]
## Parcel 78, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | | Source-Term Concentration (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? | |
| **Metals** | | | | | | | | | | |
| Aluminum | 3.12E+04 | 7.80E+03 | Y | NA | NA | 6.27E+05 | N | NA | NA | 3.12E+04 |
| Beryllium | 3.16E+00 | 9.60E+00 | N | NA | NA | 4.08E+02 | N | NA | NA | |
| Boron | 9.64E+00 | 7.03E+02 | N | NA | NA | 5.67E+04 | N | NA | NA | |
| Copper | 5.34E+01 | 3.13E+02 | N | NA | NA | 2.52E+04 | N | NA | NA | |
| Iron | 8.00E+04 | 2.34E+03 | Y | NA | NA | 1.89E+05 | N | NA | NA | 8.00E+04 |
| Nickel | 4.03E+01 | 1.54E+02 | N | NA | NA | 1.20E+04 | N | NA | NA | |
| Zinc | 1.25E+02 | 2.34E+03 | N | NA | NA | 1.88E+05 | N | NA | NA | |
| **Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 1.10E-02 | NA | NA | 1.79E+00 | N | NA | NA | 1.22E+02 | N | |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Benzo(a)anthracene | 1.70E-01 | NA | NA | 8.51E-01 | N | NA | NA | 5.81E+01 | N | |
| Chrysene | 1.70E-01 | NA | NA | 8.61E+01 | N | NA | NA | 5.90E+03 | N | |
| Fluoranthene | 1.90E-01 | 3.09E+02 | N | NA | NA | 2.43E+04 | N | NA | NA | |
| Phenanthrene | 2.50E-01 | 2.32E+03 | N | NA | NA | 1.82E+05 | N | NA | NA | |
| Pyrene | 2.80E-01 | 2.33E+02 | N | NA | NA | 1.85E+04 | N | NA | NA | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
mg/kg = milligrams per kilogram
COPC = Chemical of potential concern.
NA = Not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as 0 to 1 foot below ground surface.

## Table C1-4

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Surface Soil[a]
## Parcel 78, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/kg) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Aluminum | 3.12E+04 | 4.00E-01 | NA |
| Iron* | 8.00E+04 | 3.41E+00 | NA |
| **Total HI / ILCR** | | **4.00E-01** | **NA** |

[a] Surface soil is defined as 0 to 1 foot below ground surface.
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
mg/kg = milligrams per kilogram
NA = Not applicable

* Due to concerns about the oral RfD, iron is evaluated qualitatively in the toxicological profile and text. The iron HI is not added the total HI.

## Table C1-5

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 78, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| LF1-W02 | UB03687 | 8-Jun-1994 | Explosives, Herb, Metals, Pesticides, SVOC, VOC |
| LF1-W02 | UB04474 | 30-Jun-1994 | Explosives, SVOC |

Herb - Herbicides
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
NA - Not applicable

## Table C1-6

## Selection of Site-Related Chemicals for Surface Water
## Parcel 78, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 1 / 1 | 100 | 4.61E-01 | 4.61E-01 | NA | | 5.26E+00 | 1.70E+01 | N (a) |
| Arsenic | 1 / 1 | 100 | 5.48E-03 | 5.48E-03 | NA | | 2.17E-03 | 1.05E-02 | N (b) |
| Barium | 1 / 1 | 100 | 3.71E-02 | 3.71E-02 | NA | | 7.54E-02 | 1.13E-01 | N (a) |
| Calcium | 1 / 1 | 100 | 2.31E+01 | 2.31E+01 | NA | | 2.52E+01 | 6.41E+01 | N (a) |
| Iron | 1 / 1 | 100 | 9.10E-01 | 9.10E-01 | NA | | 1.96E+01 | 4.12E+01 | N (a) |
| Lead | 1 / 1 | 100 | 7.84E-03 | 7.84E-03 | NA | | 8.67E-03 | 4.73E-02 | N (a) |
| Magnesium | 1 / 1 | 100 | 1.04E+01 | 1.04E+01 | NA | | 1.10E+01 | 2.44E+01 | N (a) |
| Manganese | 1 / 1 | 100 | 2.18E-02 | 2.18E-02 | NA | | 5.65E-01 | 1.83E+00 | N (a) |
| Sodium | 1 / 1 | 100 | 5.34E+00 | 5.34E+00 | NA | | 3.44E+00 | 1.52E+01 | N (b) |
| **Explosives** | | | | | | | | | |
| 1,3-Dinitrobenzene | 1 / 2 | 50 | 7.07E-04 | 7.07E-04 | 4.58E-04 | 4.58E-04 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | |
| 1,1,1-Trichloroethane | 1 / 1 | 100 | 1.50E-03 | 1.50E-03 | NA | | | | Y |
| Chlorobenzene | 1 / 1 | 100 | 1.90E-03 | 1.90E-03 | NA | | | | Y |

mg/L = milligrams per liter
NA = not available
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Background criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C1-7

## Selection of Chemicals of Potential Concern for Surface Water
## Parcel 78, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Explosives** | | | | | | | | | |
| 1,3-Dinitrobenzene | 7.07E-04 | 1.55E-03 | N | NA | NA | 1.55E-03 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| 1,1,1-Trichloroethane | 1.50E-03 | 2.78E+00 | N | NA | NA | 2.78E+00 | N | NA | NA |
| Chlorobenzene | 1.90E-03 | 2.38E-01 | N | NA | NA | 2.38E-01 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
mg/L = milligrams per liter
NA = Not applicable
COPC = Chemical of potential concern.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C1-8

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 78, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| LF1-D02 | UB03748 | 9-Jun-1994 | NA | Explosives, Metals, PCB/Pesticides, SVOC, VOC |
| LF1-D02 | UB04486 | 1-Jul-1994 | NA | Explosives, SVOC* |

SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds
PCB = Polychlorinated biphenyls
NA = Not available
* SVOC analyzed were limited to 2,4-dinitrotoluene, 2,6-dinitrotoluene, and nitrobenzene.

## Table C1-9

## Selection of Site-Related Chemicals for Sediment
## Parcel 78, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion [a] (mg/kg) | 95% UTL[b] (mg/kg) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 1 / 1 | 100 | 6.62E+03 | 6.62E+03 | NA | | 6.62E+03 | 8.59E+03 | 1.43E+04 | N (a) |
| Arsenic | 1 / 1 | 100 | 5.92E+00 | 5.92E+00 | NA | | 5.92E+00 | 1.13E+01 | 2.01E+01 | N (a) |
| Barium | 1 / 1 | 100 | 2.47E+02 | 2.47E+02 | NA | | 2.47E+02 | 9.89E+01 | 1.91E+02 | Y |
| Beryllium | 1 / 1 | 100 | 7.93E-01 | 7.93E-01 | NA | | 7.93E-01 | 9.70E-01 | 1.24E+00 | N (a) |
| Calcium | 1 / 1 | 100 | 2.97E+04 | 2.97E+04 | NA | | 2.97E+04 | 1.11E+03 | 2.81E+03 | N (d) |
| Chromium | 1 / 1 | 100 | 2.37E+01 | 2.37E+01 | NA | | 2.37E+01 | 3.12E+01 | 6.33E+01 | N (a) |
| Cobalt | 1 / 1 | 100 | 9.67E+00 | 9.67E+00 | NA | | 9.67E+00 | 1.10E+01 | 2.19E+01 | N (a) |
| Copper | 1 / 1 | 100 | 1.21E+01 | 1.21E+01 | NA | | 1.21E+01 | 1.71E+01 | 3.68E+01 | N (a) |
| Iron | 1 / 1 | 100 | 3.86E+04 | 3.86E+04 | NA | | 3.86E+04 | 3.53E+04 | 5.19E+04 | N (b) |
| Lead | 1 / 1 | 100 | 1.36E+01 | 1.36E+01 | NA | | 1.36E+01 | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 1 / 1 | 100 | 1.64E+04 | 1.64E+04 | NA | | 1.64E+04 | 9.06E+02 | 2.20E+03 | N (d) |
| Manganese | 1 / 1 | 100 | 1.60E+03 | 1.60E+03 | NA | | 1.60E+03 | 7.12E+02 | 2.05E+03 | N (b) |
| Nickel | 1 / 1 | 100 | 9.52E+00 | 9.52E+00 | NA | | 9.52E+00 | 1.30E+01 | 3.16E+01 | N (a) |
| Potassium | 1 / 1 | 100 | 2.94E+02 | 2.94E+02 | NA | | 2.94E+02 | 1.01E+03 | 2.79E+03 | N (a) |
| Vanadium | 1 / 1 | 100 | 3.38E+01 | 3.38E+01 | NA | | 3.38E+01 | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 1 / 1 | 100 | 4.16E+01 | 4.16E+01 | NA | | 4.16E+01 | 5.27E+01 | 1.11E+02 | N (a) |

mg/kg = milligrams per kilogram
NA = not available
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C1-10

## Selection of Chemicals of Potential Concern for Sediment
## Parcel 78, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Barium | 2.47E+02 | 8.36E+04 | N | NA | NA | 8.36E+04 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
mg/kg = milligrams per kilogram
COPC = Chemical of potential concern.
NA = Not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C1-11

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 78, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| LF1-G01 | A-0001 | 12-Feb-1998 | Expl, Metals, Pest/PCB, SVOC, VOC |
| LF1-G02 | A-0002 | 12-Feb-1998 | Expl, Metals, Pest/PCB, SVOC, VOC |
| LF1-G03 | A-0005 | 12-Feb-1998 | Expl, Metals, Pest/PCB, SVOC, VOC |
| LF1-G01 | LF1-G01-971003 | 3-Oct-1997 | Metals |
| LF1-G04 | UB04503 | 4-Jul-1994 | CAB, Aromatics, Expl, Herb, Organosulfans, Metals, SVOC, Pest/PCB, VOC |
| LF1-G04 | UC00357* | 31-Jan-1995 | CAB, Aromatics, Expl, Herb, Organosulfans, Metals, SVOC, Pest/PCB, VOC |

* - The electronic data set provided by SAIC included two sets of analytical results for sample number UC00357.
The IT Data Acquisition and Management Group (DAM) theorizes that the two sets present results before and after dilution during the analytical process. DAM recommends using the lower set of values because dilution usually improves both the accuracy and precision of the analytical methods and results in lower values. The original data packages are not available for further clarification.

CAB - Chemical Agent Breakdown Products

Expl - Explosives

Herb - Herbicides

Pest/PCB - Pesticides and Polychlorinated biphenyls

SVOC - Semivolatile organic compounds

VOC - Volatile organic compounds

## Table C1-12

## Selection of Site-Related Chemicals for Groundwater
## Parcel 78, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 4 / 6 | 67 | 2.02E-01 | 2.87E+00 | 2.00E-01 | 2.00E-01 | 8.23E-01 | 2.34E+00 | 9.60E+00 | N (b) |
| Barium | 4 / 6 | 67 | 5.11E-02 | 6.29E-01 | 2.00E-01 | 2.00E-01 | 3.32E-01 | 1.27E-01 | 4.72E-01 | Y |
| Cadmium | 1 / 6 | 17 | 1.00E-04 | 1.00E-04 | 5.00E-03 | 5.00E-03 | 2.10E-03 | 2.51E-03 | 5.30E-03 | N (a) |
| Calcium | 6 / 6 | 100 | 1.74E+01 | 9.94E+01 | 5.00E+00 | 5.00E+00 | 5.34E+01 | 5.65E+01 | 4.52E+02 | N (b) |
| Iron | 6 / 6 | 100 | 1.22E-01 | 5.16E+00 | 1.00E-01 | 1.00E-01 | 1.46E+00 | 7.04E+00 | 2.58E+01 | N (a) |
| Lead | 2 / 5 | 40 | 1.40E-03 | 7.21E-03 | 3.00E-03 | 4.47E-03 | 2.77E-03 | 8.00E-03 | 2.58E-02 | N (a) |
| Magnesium | 6 / 6 | 100 | 8.25E+00 | 6.00E+01 | 5.00E+00 | 5.00E+00 | 2.35E+01 | 2.13E+01 | 1.49E+02 | N (b) |
| Manganese | 6 / 6 | 100 | 8.49E-02 | 1.44E+00 | 1.50E-02 | 1.50E-02 | 4.24E-01 | 5.81E-01 | 4.13E+00 | N (b) |
| Potassium | 3 / 6 | 50 | 7.35E-01 | 2.30E+00 | 5.00E+00 | 5.00E+00 | 2.04E+00 | 7.20E+00 | 6.85E+01 | N (a) |
| Sodium | 6 / 6 | 100 | 1.12E+01 | 4.93E+01 | 5.00E+00 | 5.00E+00 | 3.15E+01 | 1.48E+01 | 4.90E+01 | N (d) |
| Zinc | 3 / 6 | 50 | 2.18E-02 | 3.24E-02 | 1.80E-02 | 2.00E-02 | 1.86E-02 | 2.20E-01 | 1.52E+00 | N (a) |
| **Pesticides/PCBs** | | | | | | | | | | |
| gamma-BHC (Lindane) | 1 / 5 | 20 | 1.03E-05 | 1.03E-05 | 5.00E-05 | 7.20E-03 | 7.37E-04 | | | Y |
| **Semivolatile Organics** | | | | | | | | | | |
| Di-n-butyl phthalate | 3 / 5 | 60 | 2.70E-03 | 1.20E-02 | 1.00E-02 | 3.30E-02 | 1.03E-02 | | | Y |
| **Volatile Organics** | | | | | | | | | | |
| 1,1,1-Trichloroethane | 2 / 5 | 40 | 1.60E-03 | 2.10E-03 | 1.00E-03 | 1.00E-03 | 1.04E-03 | | | Y |

mg/L = milligram per Liter

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C1-13

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 78, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Residential | | | | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| | | Noncancer | COPC? | Cancer | COPC? | | | |
| **Metals** | | | | | | | | |
| Barium | 6.29E-01 | 1.10E-01 | Y | NA | NA | L | 8.37E-01 | 6.29E-01 |
| **Pesticides/PCBs** | | | | | | | | |
| gamma-BHC (Lindane) | 1.03E-05 | 4.60E-04 | N | 5.03E-05 | N | | | |
| **Semivolatile Organics** | | | | | | | | |
| Di-n-butyl phthalate | 1.20E-02 | 1.48E-01 | N | NA | NA | | | |
| **Volatile Organics** | | | | | | | | |
| 1,1,1-Trichloroethane | 2.10E-03 | 3.05E-01 | N | NA | NA | | | |

mg/L = milligram per Liter
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C1-14

## Cancer Risk and Noncancer Hazard Estimates for the Resident Exposed to Groundwater
## Parcel 78, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk | |
|---|---|---|---|
| | | Residential | |
| | | HI | ILCR |
| **Metals** | | | |
| Barium | 6.29E-01 | 5.74E-01 | NA |
| **Total HI / ILCR** | | **5.74E-01** | **NA** |

mg/L = milligram per Liter
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C1-15

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcel 78, Fort McClellan, Alabama

| Medium | Resident | | Recreational Site User | |
|---|---|---|---|---|
| | HI | ILCR | HI | ILCR |
| Surface Soil | 4.00E-01 | NA | NA | NA |
| Groundwater | 5.74E-01 | NA | NA | NA |
| Surface Water | NA | NA | NA | NA |
| Sediment | NA | NA | NA | NA |
| **Total HI / ILCR** | **9.74E-01** | **NA** | **NA** | **NA** |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C2-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 79, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| FA-79-SS01 | DD0028 | 1-Mar-2001 | 0 - 1 | Metals, OP Pest, PCBs, SVOCs, VOCs |
| FA-79-SS02 | DD0029 | 1-Mar-2001 | 0 - 1 | Metals, OP Pest, PCBs, SVOCs, VOCs |
| FA-79-SS03 | DD0030 | 1-Mar-2001 | 0 - 1 | Metals, OP Pest, PCBs, SVOCs, VOCs |
| FA-79-SS04 | DD0031 | 2-Mar-2001 | 0 - 1 | Metals, OP Pest, PCBs, SVOCs, VOCs |
| FA-79-SS05 | DD0032 | 2-Mar-2001 | 0 - 1 | Metals, OP Pest, PCBs, SVOCs, VOCs |

OP Pest = Organophosphate Pesticides
PCBs = Polychlorinated biphenyls
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds
ft = Feet

## Table C2-2

## Selection of Site-Related Chemicals for Surface Soil[a]
## Parcel 79, Fort McClellan, Alabama

(Page 1 of 2)

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 5 / 5 | 100 | 8.72E+03 | 1.66E+04 | 2.44E+01 | 2.75E+01 | 1.33E+04 | 1.63E+04 | 2.14E+04 | N (b) |
| Antimony | 3 / 5 | 60 | 1.19E+01 | 1.84E+01 | 1.22E+01 | 1.38E+01 | 9.54E+00 | 1.99E+00 | 2.64E+00 | Y |
| Arsenic | 5 / 5 | 100 | 4.38E+00 | 6.20E+01 | 1.00E+00 | 1.00E+00 | 2.95E+01 | 1.37E+01 | 2.54E+01 | Y |
| Barium | 5 / 5 | 100 | 1.30E+02 | 1.56E+03 | 1.22E+00 | 1.38E+00 | 7.83E+02 | 1.24E+02 | 1.94E+02 | Y |
| Beryllium | 5 / 5 | 100 | 3.21E-01 | 2.15E+00 | 1.22E+00 | 1.38E+00 | 1.08E+00 | 8.00E-01 | 8.68E-01 | Y |
| Cadmium | 4 / 5 | 80 | 2.77E-01 | 3.86E+00 | 6.10E-01 | 6.89E-01 | 2.22E+00 | 2.90E-01 | 2.09E-01 | Y |
| Calcium | 5 / 5 | 100 | 2.13E+03 | 2.27E+04 | 1.22E+02 | 1.38E+02 | 1.18E+04 | 1.72E+03 | 3.54E+03 | N (d) |
| Chromium | 5 / 5 | 100 | 1.39E+01 | 1.40E+02 | 1.22E+00 | 1.38E+00 | 8.58E+01 | 3.70E+01 | 6.44E+01 | Y |
| Cobalt | 5 / 5 | 100 | 3.38E+00 | 2.00E+01 | 2.44E+00 | 2.75E+00 | 9.70E+00 | 1.52E+01 | 3.25E+01 | N (b) |
| Copper | 5 / 5 | 100 | 2.83E+01 | 1.22E+03 | 2.44E+00 | 2.75E+00 | 3.77E+02 | 1.27E+01 | 2.25E+01 | Y |
| Iron | 5 / 5 | 100 | 1.24E+04 | 1.60E+05 | 2.44E+01 | 2.65E+02 | 6.14E+04 | 3.42E+04 | 5.54E+04 | Y |
| Lead | 5 / 5 | 100 | 1.31E+02 | 2.52E+03 | 1.00E+00 | 1.00E+00 | 1.23E+03 | 4.01E+01 | 6.38E+01 | Y |
| Magnesium | 5 / 5 | 100 | 6.08E+02 | 4.92E+03 | 1.22E+02 | 1.38E+02 | 2.67E+03 | 1.03E+03 | 9.60E+03 | N (b) |
| Manganese | 5 / 5 | 100 | 2.07E+02 | 1.73E+03 | 1.22E+00 | 1.38E+00 | 8.33E+02 | 1.58E+03 | 4.66E+03 | N (b) |
| Mercury | 5 / 5 | 100 | 6.40E-02 | 1.24E+00 | 1.22E-01 | 1.38E-01 | 4.61E-01 | 8.00E-02 | 3.22E-01 | Y |
| Nickel | 5 / 5 | 100 | 5.41E+00 | 8.25E+01 | 2.44E+00 | 2.75E+00 | 3.40E+01 | 1.03E+01 | 2.00E+01 | Y |
| Potassium | 3 / 3 | 100 | 1.31E+03 | 2.00E+03 | 6.62E+02 | 6.89E+02 | 1.59E+03 | 8.00E+02 | 6.01E+03 | N (b) |
| Selenium | 1 / 5 | 20 | 6.95E-01 | 6.95E-01 | 1.00E+00 | 1.00E+00 | 2.94E-01 | 4.80E-01 | 1.28E+00 | N (b) |
| Silver | 1 / 5 | 20 | 2.40E+01 | 2.40E+01 | 1.22E+00 | 1.38E+00 | 5.02E+00 | 3.60E-01 | 1.13E+00 | Y |
| Sodium | 5 / 5 | 100 | 3.93E+01 | 2.74E+02 | 1.22E+02 | 1.38E+02 | 1.68E+02 | 6.34E+02 | 5.63E+02 | N (a) |
| Thallium | 3 / 5 | 60 | 1.12E+00 | 1.86E+00 | 2.00E+00 | 2.00E+00 | 9.69E-01 | 3.43E+00 | 4.53E-01 | N (a) |
| Vanadium | 5 / 5 | 100 | 2.13E+01 | 3.58E+01 | 1.22E+00 | 1.38E+00 | 2.94E+01 | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 5 / 5 | 100 | 1.63E+02 | 2.96E+03 | 2.44E+00 | 2.75E+00 | 1.34E+03 | 4.06E+01 | 7.37E+01 | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Acenaphthene | 1 / 5 | 20 | 1.30E+00 | 1.30E+00 | 8.00E-01 | 9.10E-01 | 4.48E-01 | | | Y |
| Anthracene | 1 / 5 | 20 | 3.00E+00 | 3.00E+00 | 8.00E-01 | 9.10E-01 | 7.54E-01 | | | Y |
| Benzo(a)anthracene | 1 / 5 | 20 | 6.70E+00 | 6.70E+00 | 8.00E-01 | 9.10E-01 | 1.49E+00 | | | Y |
| Benzo(a)pyrene | 1 / 5 | 20 | 6.00E+00 | 6.00E+00 | 8.00E-01 | 9.10E-01 | 1.37E+00 | | | Y |
| Benzo(b)fluoranthene | 1 / 5 | 20 | 1.20E+01 | 1.20E+01 | 8.00E-01 | 9.10E-01 | 2.61E+00 | | | Y |
| Benzo(ghi)perylene | 1 / 5 | 20 | 2.20E+00 | 2.20E+00 | 8.00E-01 | 9.10E-01 | 5.75E-01 | | | Y |
| Carbazole | 1 / 5 | 20 | 2.40E+00 | 2.40E+00 | 8.00E-01 | 9.10E-01 | 7.15E-01 | | | Y |
| Chrysene | 1 / 5 | 20 | 6.70E+00 | 6.70E+00 | 8.00E-01 | 9.10E-01 | 1.51E+00 | | | Y |
| Dibenz(a,h)anthracene | 1 / 5 | 20 | 7.40E-01 | 7.40E-01 | 8.00E-01 | 9.10E-01 | 2.67E-01 | | | Y |
| Dibenzofuran | 1 / 5 | 20 | 6.20E-01 | 6.20E-01 | 8.00E-01 | 9.10E-01 | 3.03E-01 | | | Y |
| Fluoranthene | 1 / 5 | 20 | 7.80E+00 | 7.80E+00 | 8.00E-01 | 9.10E-01 | 1.71E+00 | | | Y |
| Fluorene | 1 / 5 | 20 | 1.40E+00 | 1.40E+00 | 8.00E-01 | 9.10E-01 | 4.52E-01 | | | Y |
| Indeno(1,2,3-cd)pyrene | 1 / 5 | 20 | 2.20E+00 | 2.20E+00 | 8.00E-01 | 9.10E-01 | 5.55E-01 | | | Y |
| Phenanthrene | 1 / 5 | 20 | 6.80E+00 | 6.80E+00 | 8.00E-01 | 9.10E-01 | 1.53E+00 | | | Y |
| Pyrene | 1 / 5 | 20 | 9.80E+00 | 9.80E+00 | 8.00E-01 | 9.10E-01 | 2.13E+00 | | | Y |

## Table C2-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 79, Fort McClellan, Alabama



| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | | |
| Acetone | 3 / 5 | 60 | 2.60E-01 | 3.30E-01 | 2.60E-02 | 1.90E+00 | 2.24E-01 | | | Y |
| Benzene | 1 / 5 | 20 | 1.80E-03 | 1.80E-03 | 6.40E-03 | 4.80E-01 | 3.71E-03 | | | Y |
| p-Cymene | 1 / 5 | 20 | 2.90E-03 | 2.90E-03 | 6.40E-03 | 4.80E-01 | 1.18E-02 | | | Y |

mg/kg = milligrams per kilogram
NA = not available
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.
[b] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[d] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C2-3

### Selection of Chemicals of Potential Concern for Surface Soil[a]
### Parcel 79, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | | Statistical Distribution [b] | 95% UCL [c] (mg/kg) | Source-Term Concentration [d] (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? | | | |
| **Metals** | | | | | | | | | | | | |
| Antimony | 1.84E+01 | 3.11E+00 | Y | NA | NA | 2.47E+02 | N | NA | NA | N | 1.64E+01 | 1.64E+01 |
| Arsenic | 6.20E+01 | 2.34E+00 | Y | 4.26E-01 | Y | 1.89E+02 | N | 2.94E+01 | Y | N | 5.25E+01 | 5.25E+01 |
| Barium | 1.56E+03 | 5.47E+02 | Y | NA | NA | 4.41E+04 | N | NA | NA | N | 1.38E+03 | 1.38E+03 |
| Beryllium | 2.15E+00 | 9.60E+00 | N | NA | NA | 4.08E+02 | N | NA | NA | | | |
| Cadmium | 3.86E+00 | 6.25E+00 | N | NA | NA | 3.43E+02 | N | NA | NA | | | |
| Chromium | 1.40E+02 | 2.32E+01 | Y | NA | NA | 1.82E+03 | N | NA | NA | L | 2.11E+02 | 1.40E+02 |
| Copper | 1.22E+03 | 3.13E+02 | Y | NA | NA | 2.52E+04 | N | NA | NA | L | 1.36E+03 | 1.22E+03 |
| Iron | 1.60E+05 | 2.34E+03 | Y | NA | NA | 1.89E+05 | N | NA | NA | L | 1.81E+05 | 1.60E+05 |
| Lead | 2.52E+03 | 4.00E+02 | Y | NA | NA | 4.00E+02 | Y | NA | NA | N | 2.21E+03 | 2.21E+03 |
| Mercury | 1.24E+00 | 2.33E+00 | N | NA | NA | 1.84E+02 | N | NA | NA | | | |
| Nickel | 8.25E+01 | 1.54E+02 | N | NA | NA | 1.20E+04 | N | NA | NA | | | |
| Silver | 2.40E+01 | 3.91E+01 | N | NA | NA | 3.16E+03 | N | NA | NA | | | |
| Zinc | 2.96E+03 | 2.34E+03 | Y | NA | NA | 1.88E+05 | N | NA | NA | N | 2.43E+03 | 2.43E+03 |
| **Semivolatile Organic Compounds** | | | | | | | | | | | | |
| Acenaphthene | 1.30E+00 | 4.63E+02 | N | NA | NA | 3.64E+04 | N | NA | NA | | | |
| Anthracene | 3.00E+00 | 2.33E+03 | N | NA | NA | 1.84E+05 | N | NA | NA | | | |
| Benzo(a)anthracene | 6.70E+00 | NA | NA | 8.51E-01 | Y | NA | NA | 5.81E+01 | N | NP | 7.31E+00 | 6.70E+00 |
| Benzo(a)pyrene | 6.00E+00 | NA | NA | 8.51E-02 | Y | NA | NA | 5.81E+00 | Y | NP | 6.54E+00 | 6.00E+00 |
| Benzo(b)fluoranthene | 1.20E+01 | NA | NA | 8.51E-01 | Y | NA | NA | 5.81E+01 | N | NP | 1.31E+01 | 1.20E+01 |
| Benzo(ghi)perylene | 2.20E+00 | 2.32E+02 | N | NA | NA | 1.82E+04 | N | NA | NA | | | |
| Carbazole | 2.40E+00 | NA | NA | 3.11E+01 | N | NA | NA | 2.12E+03 | N | | | |
| Chrysene | 6.70E+00 | NA | NA | 8.61E+01 | N | NA | NA | 5.90E+03 | N | | | |
| Dibenz(a,h)anthracene | 7.40E-01 | NA | NA | 8.61E-02 | Y | NA | NA | 5.90E+00 | N | NP | 7.96E-01 | 7.40E-01 |
| Dibenzofuran | 6.20E-01 | 3.09E+01 | N | NA | NA | 2.43E+03 | N | NA | NA | | | |
| Fluoranthene | 7.80E+00 | 3.09E+02 | N | NA | NA | 2.43E+04 | N | NA | NA | | | |
| Fluorene | 1.40E+00 | 3.09E+02 | N | NA | NA | 2.43E+04 | N | NA | NA | | | |
| Indeno(1,2,3-cd)pyrene | 2.20E+00 | NA | NA | 8.51E-01 | Y | NA | NA | 5.81E+01 | N | NP | 2.39E+00 | 2.20E+00 |
| Phenanthrene | 6.80E+00 | 2.32E+03 | N | NA | NA | 1.82E+05 | N | NA | NA | | | |
| Pyrene | 9.80E+00 | 2.33E+02 | N | NA | NA | 1.85E+04 | N | NA | NA | | | |
| **Volatile Organic Compounds** | | | | | | | | | | | | |
| Acetone | 3.30E-01 | 7.76E+02 | N | NA | NA | 6.16E+04 | N | NA | NA | | | |
| Benzene | 1.80E-03 | 2.33E+01 | N | 2.17E+01 | N | 1.86E+03 | N | 1.49E+03 | N | | | |
| p-Cymene | 2.90E-03 | 1.55E+03 | N | NA | NA | 1.23E+05 | N | NA | NA | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.
[b] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[c] 95% UCL calculated only for COPC with at least 5 samples.
[d] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C2-4

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Surface Soil[a]
## Parcel 79, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/kg) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Antimony | 1.64E+01 | 5.28E-01 | NA |
| Arsenic | 5.25E+01 | 2.24E+00 | 1.23E-04 |
| Barium | 1.38E+03 | 2.52E-01 | NA |
| Chromium | 1.40E+02 | 6.04E-01 | NA |
| Copper | 1.22E+03 | 3.90E-01 | NA |
| Iron | 1.60E+05 | 6.82E+00 | NA |
| Lead | 2.21E+03 | NA | NA |
| Zinc | 2.43E+03 | 1.04E-01 | NA |
| **Semivolatile Organic Compounds** | | | |
| Benzo(a)anthracene | 6.70E+00 | NA | 7.87E-06 |
| Benzo(a)pyrene | 6.00E+00 | NA | 7.05E-05 |
| Benzo(b)fluoranthene | 1.20E+01 | NA | 1.41E-05 |
| Dibenz(a,h)anthracene | 7.40E-01 | NA | 8.60E-06 |
| Indeno(1,2,3-cd)pyrene | 2.20E+00 | NA | 2.59E-06 |
| **Total HI / ILCR** | | 1.09E+01 | 2.27E-04 |

[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C2-5

## Separation of Noncancer Hazard by Target Organ for Resident Parcel 79, Fort McClellan, Alabama

| COPC | Heart | Skin | Vascular System | Cardiovascular | GI | Liver | Kidney | Erythrocyte | Testes | ND |
|---|---|---|---|---|---|---|---|---|---|---|
| ***For Surface Soil:*** | | | | | | | | | | |
| Antimony | 5.28E-01 | | | | | | | | | |
| Arsenic | | 2.24E+00 | 2.24E+00 | | | | | | | |
| Barium | | | | 2.52E-01 | | | 2.52E-01 | | | |
| Chromium | | | | | | | | | | 6.04E-01 |
| Copper | | | | | 3.90E-01 | 3.90E-01 | 3.90E-01 | 3.90E-01 | | |
| Zinc | | | | | | | | 1.04E-01 | | |
| ***For Groundwater:*** | | | | | | | | | | |
| Beryllium | | | | | 1.21E-01 | | | | | |
| Boron | | | | | | | | | 1.42E-01 | |
| Chromium | | | | | | | | | | 3.49E-01 |
| **Resident HI by Target Organ:** | 5.28E-01 | 2.24E+00 | 2.24E+00 | 2.52E-01 | 5.11E-01 | 3.90E-01 | 6.42E-01 | 4.94E-01 | 1.42E-01 | 9.53E-01 |

COPC = Chemical of potential concern
URT = Upper Respiratory Tract
GI = Gastrointestinal
ND = No data
* See Toxicological Profiles for data regarding selection of target organs.

## Table C2-6

## Remedial Goal Options Based on Noncancer Effects for Resident
## Surface Soil
## Parcel 79, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/kg) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/kg) Based on an HI of: 0.1 | 1 | 3 |
|---|---|---|---|---|---|
| **Metals** | | | | | |
| Arsenic | 5.25E+01 | 2.24E+00 | 2.34E+00 | 2.34E+01 | 7.03E+01 |
| Lead | 2.21E+03 | NA | Clean-up Level: 400 mg/kg* | | |

COC = Chemical of concern.
HI = Hazard index
mg/kg = Milligrams per kilogram
* Based on EPA (1994) IEUBK Model

## Table C2-7

## Remedial Goal Options Based on Cancer for Resident
## Surface Soil
## Parcel 79, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/kg) | ILCR (all pathways) for COC | Cancer Remedial Goal Options (mg/kg) Based on an ILCR of : 1.00E-06 | 1.00E-05 | 1.00E-04 |
|---|---|---|---|---|---|
| **Metals** | | | | | |
| Arsenic | 5.25E+01 | 1.23E-04 | 4.26E-01 | 4.26E+00 | 4.26E+01 |
| **Semivolatile Organic Compounds** | | | | | |
| Benzo(a)anthracene | 6.70E+00 | 7.87E-06 | 8.51E-01 | 8.51E+00 | 8.51E+01 |
| Benzo(a)pyrene | 6.00E+00 | 7.05E-05 | 8.51E-02 | 8.51E-01 | 8.51E+00 |
| Benzo(b)fluoranthene | 1.20E+01 | 1.41E-05 | 8.51E-01 | 8.51E+00 | 8.51E+01 |
| Dibenz(a,h)anthracene | 7.40E-01 | 8.60E-06 | 8.61E-02 | 8.61E-01 | 8.61E+00 |
| Indeno(1,2,3-cd)pyrene | 2.20E+00 | 2.59E-06 | 8.51E-01 | 8.51E+00 | 8.51E+01 |

COC = Chemical of concern.
ILCR = Incremental lifetime cancer risk.

## Table C2-8

## Cancer Risk and Noncancer Hazard Estimates for Recreational Site User Exposed to Surface Soil[a]
## Parcel 79, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/kg) | Total Noncancer Hazard / Cancer Risk Recreational Site User HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Arsenic | 5.25E+01 | NA | 1.79E-06 |
| Lead | 2.21E+03 | NA | NA |
| **Semivolatile Organic Compounds** | | | |
| Benzo(a)pyrene | 6.00E+00 | NA | 1.03E-06 |
| **Total HI / ILCR** | | NA | 2.82E-06 |

[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C2-9

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 79, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| LF2-W02 | UB03940 | 14-Jun-1994 | NA | Nitroaromatics, Herbicides, PCBs, Pesticides, Metals, SVOC, VOC |
| LF2-W02 | UB04480 | 1-Jul-1994 | NA | Nitroaromatics, SVOC |

SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
PCB - Polychlorinated biphenyls

## Table C2-10

## Selection of Site-Related Chemicals for Surface Water
## Parcel 79, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 1 / 1 | 100 | 1.57E-01 | 1.57E-01 | NA | | 5.26E+00 | 1.70E+01 | N (a) |
| Barium | 1 / 1 | 100 | 1.85E-02 | 1.85E-02 | NA | | 7.54E-02 | 1.13E-01 | N (a) |
| Calcium | 1 / 1 | 100 | 1.19E+01 | 1.19E+01 | NA | | 2.52E+01 | 6.41E+01 | N (a) |
| Iron | 1 / 1 | 100 | 2.55E-01 | 2.55E-01 | NA | | 1.96E+01 | 4.12E+01 | N (a) |
| Magnesium | 1 / 1 | 100 | 6.73E+00 | 6.73E+00 | NA | | 1.10E+01 | 2.44E+01 | N (a) |
| Manganese | 1 / 1 | 100 | 1.37E-02 | 1.37E-02 | NA | | 5.65E-01 | 1.83E+00 | N (a) |
| Potassium | 1 / 1 | 100 | 1.33E+00 | 1.33E+00 | NA | | 2.56E+00 | 4.25E+00 | N (a) |
| Sodium | 1 / 1 | 100 | 1.13E+00 | 1.13E+00 | NA | | 3.44E+00 | 1.52E+01 | N (a) |

mg/L = milligrams per liter
NA = not available
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C2-11

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 79, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| LF2-D02 | UB03751 | 9-Jun-1994 | NA | Nitroaromatics, Metals, PCBs, Pesticides, SVOC, VOC |
| LF2-D02 | UB04488 | 1-Jul-1994 | NA | Nitroaromatics, SVOC |

SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
PCB - Polychlorinated biphenyls

## Table C2-12

## Selection of Site-Related Chemicals for Sediment
## Parcel 79, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [a] (mg/kg) | 95% UTL[b] (mg/kg) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 1 / 1 | 100 | 3.85E+03 | 3.85E+03 | NA | | 8.59E+03 | 1.43E+04 | N (a) |
| Barium | 1 / 1 | 100 | 2.51E+01 | 2.51E+01 | NA | | 9.89E+01 | 1.91E+02 | N (a) |
| Calcium | 1 / 1 | 100 | 4.78E+02 | 4.78E+02 | NA | | 1.11E+03 | 2.81E+03 | N (a) |
| Chromium | 1 / 1 | 100 | 1.51E+01 | 1.51E+01 | NA | | 3.12E+01 | 6.33E+01 | N (a) |
| Cobalt | 1 / 1 | 100 | 3.63E+00 | 3.63E+00 | NA | | 1.10E+01 | 2.19E+01 | N (a) |
| Copper | 1 / 1 | 100 | 1.02E+01 | 1.02E+01 | NA | | 1.71E+01 | 3.68E+01 | N (a) |
| Iron | 1 / 1 | 100 | 2.01E+04 | 2.01E+04 | NA | | 3.53E+04 | 5.19E+04 | N (a) |
| Lead | 1 / 1 | 100 | 1.81E+01 | 1.81E+01 | NA | | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 1 / 1 | 100 | 7.35E+02 | 7.35E+02 | NA | | 9.06E+02 | 2.20E+03 | N (a) |
| Manganese | 1 / 1 | 100 | 2.06E+02 | 2.06E+02 | NA | | 7.12E+02 | 2.05E+03 | N (a) |
| Nickel | 1 / 1 | 100 | 6.78E+00 | 6.78E+00 | NA | | 1.30E+01 | 3.16E+01 | N (a) |
| Potassium | 1 / 1 | 100 | 2.89E+02 | 2.89E+02 | NA | | 1.01E+03 | 2.79E+03 | N (a) |
| Vanadium | 1 / 1 | 100 | 1.46E+01 | 1.46E+01 | NA | | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 1 / 1 | 100 | 2.24E+01 | 2.24E+01 | NA | | 5.27E+01 | 1.11E+02 | N (a) |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Benzyl Alcohol | 1 / 1 | 100 | 6.60E-02 | 6.60E-02 | NA | | | | Y |

mg/kg = milligrams per kilogram
NA = not available
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C2-13

## Selection of Chemicals of Potential Concern for Sediment
## Parcel 79, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Benzyl Alcohol | 6.60E-02 | 3.16E+05 | N | NA | NA | 3.16E+05 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
mg/kg = milligrams per kilogram
NA = not applicable

## Table C2-14

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 79, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| LF2-G01 | A-0007 | 12-Feb-1998 | Expl, Metals, Pest/PCB, SVOC, VOC |
| LF2-G02 | A-0008 | 13-Feb-1998 | Expl, Metals, Pest/PCB, SVOC, VOC |
| LF2-G03 | A-0009 | 12-Feb-1998 | Expl, Metals, Pest/PCB, SVOC, VOC |
| LF2-G01 | LF2-G01-971003 | 3-Oct-1997 | Metals |
| LF2-G01 | UB04499 | 4-Jul-1994 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G03 | UB04500 | 4-Jul-1994 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G03 | UB04501 | 4-Jul-1994 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G02 | UB04502 | 4-Jul-1994 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G01 | UC00335 | 27-Jan-1995 | CAB, Expl, Herb, Organosulfansans, SVOC, VOC, Pest/PCB |
| LF2-G01 | UC00354* | 31-Jan-1995 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G02 | UC00355* | 31-Jan-1995 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G03 | UC00372* | 1-Feb-1995 | CAB, Aromatics, Expl, Herb, Metals, Organosulfansans, SVOC, Pest/PCB, VOC |
| LF2-G03 | UPB026 | 11-Jun-1992 | Metals |
| LF2-G01 | UPB027 | 11-Jun-1992 | Metals |
| LF2-G02 | UPB029 | 11-Jun-1992 | Metals |
| LF2-G03 | UPR007 | 11-Jun-1992 | CAB, Herb, Organosulfansans, SVOC, VOC, Pest/PCB |
| LF2-G01 | UPR008 | 11-Jun-1992 | CAB, Herb, Organosulfansans, SVOC, VOC, Pest/PCB |
| LF2-G02 | UPR010 | 11-Jun-1992 | CAB, Herb, Organosulfansans, SVOC, VOC, Pest/PCB |
| LF2-G03 | UPS008 | 11-Jun-1992 | Pest/PCB |
| LF2-G01 | UPS009 | 11-Jun-1992 | Pest/PCB |
| LF2-G02 | UPS011 | 11-Jun-1992 | Pest/PCB |
| LF2-G03 | UQU002 | 11-Jun-1992 | Aromatics, SVOC, VOC |
| LF2-G01 | UQU003 | 11-Jun-1992 | Aromatics, SVOC, VOC |
| LF2-G02 | UQU005 | 11-Jun-1992 | Aromatics, SVOC, VOC |
| LF2-G03 | UQV005 | 11-Jun-1992 | Expl, SVOC |
| LF2-G01 | UQV006 | 11-Jun-1992 | Expl, SVOC |
| LF2-G02 | UQV008 | 11-Jun-1992 | Expl, SVOC |
| LF2-G01 | UOX027 | 11-Jun-1992 | Metals (Arsenic only) |
| LF2-G02 | UOX029 | 11-Jun-1992 | Metals (Arsenic only) |
| LF2-G03 | UOX026 | 11-Jun-1992 | Metals (Arsenic only) |

* - The electronic data set provided by SAIC included two sets of analytical results for sample number UC00357.
The IT Data Acquisition and Management Group (DAM) theorizes that the two sets present results before and after dilution during the analytical process. DAM recommends using the lower set of values because dilution usually improves both the accuracy and precision of the analytical methods and results in lower values. The original data packages are not available for further clarification.

CAB - Chemical Agent Breakdown Products
Expl - Explosives
Herb - Herbicides
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
Pest/PCB - Pesticides and Polychlorinated biphenyls

## Table C2-15

### Selection of Site-Related Chemicals for Groundwater
### Parcel 79, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 14 / 14 | 100 | 1.45E-01 | 4.94E+00 | 2.00E-01 | 2.00E-01 | 1.34E+00 | 2.34E+00 | 9.60E+00 | N (b) |
| Arsenic | 2 / 14 | 14 | 2.47E-03 | 3.16E-03 | 1.10E-03 | 1.00E-02 | 2.18E-03 | 1.78E-02 | 2.22E-01 | N (a) |
| Barium | 11 / 14 | 79 | 1.29E-02 | 6.80E-02 | 2.00E-01 | 2.00E-01 | 4.37E-02 | 1.27E-01 | 4.72E-01 | N (a) |
| Beryllium | 3 / 14 | 21 | 1.11E-03 | 6.24E-03 | 2.00E-04 | 5.00E-03 | 1.65E-03 | 1.25E-03 | 2.37E-03 | Y |
| Boron | 1 / 10 | 10 | 2.71E-01 | 2.71E-01 | 2.30E-01 | 2.30E-01 | 1.31E-01 | 1.00E-07 | 1.00E-07 | Y |
| Cadmium | 1 / 14 | 7 | 3.00E-04 | 3.00E-04 | 5.00E-03 | 6.78E-03 | 2.53E-03 | 2.51E-03 | 5.30E-03 | N (a) |
| Calcium | 14 / 14 | 100 | 4.68E+00 | 1.63E+02 | 5.00E+00 | 5.00E+00 | 9.16E+01 | 5.65E+01 | 4.52E+02 | N (b) |
| Chromium | 2 / 14 | 14 | 2.24E-02 | 2.28E-02 | 1.00E-02 | 1.68E-02 | 9.46E-03 | | | Y |
| Iron | 14 / 14 | 100 | 1.69E-01 | 2.25E+01 | 1.00E-01 | 1.00E-01 | 4.72E+00 | 7.04E+00 | 2.58E+01 | N (b) |
| Lead | 4 / 14 | 29 | 8.00E-04 | 4.69E-02 | 3.00E-03 | 4.34E-02 | 8.81E-03 | 8.00E-03 | 2.58E-02 | Y |
| Magnesium | 14 / 14 | 100 | 6.07E+00 | 1.03E+02 | 5.00E+00 | 5.00E+00 | 5.81E+01 | 2.13E+01 | 1.49E+02 | N (b) |
| Manganese | 13 / 14 | 93 | 2.88E-02 | 2.08E+00 | 1.50E-02 | 1.50E-02 | 7.74E-01 | 5.81E-01 | 4.13E+00 | N (b) |
| Potassium | 7 / 14 | 50 | 3.43E-01 | 2.35E+00 | 1.24E+00 | 5.00E+00 | 1.53E+00 | 7.20E+00 | 6.85E+01 | N (a) |
| Sodium | 14 / 14 | 100 | 1.16E+01 | 1.22E+02 | 5.00E+00 | 5.00E+00 | 5.18E+01 | 1.48E+01 | 4.90E+01 | N (d) |
| Thallium | 1 / 14 | 7 | 2.30E-03 | 2.30E-03 | 1.00E-04 | 1.25E-01 | 1.51E-02 | 1.46E-03 | 4.16E-03 | N (b) |
| Zinc | 4 / 14 | 29 | 2.32E-02 | 1.65E-01 | 1.80E-02 | 3.00E-02 | 2.51E-02 | 2.20E-01 | 1.52E+00 | N (a) |
| **Semivolatile Organics** | | | | | | | | | | |
| Di-n-butyl phthalate | 3 / 14 | 21 | 2.70E-03 | 6.20E-03 | 1.00E-02 | 3.30E-02 | 1.39E-02 | | | Y |
| **Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 1 / 17 | 6 | 8.46E-06 | 8.46E-06 | 3.90E-06 | 1.40E-02 | 2.89E-03 | | | Y |
| Aldrin | 2 / 17 | 12 | 1.05E-05 | 1.72E-05 | 7.40E-06 | 1.30E-02 | 2.68E-03 | | | Y |
| alpha-BHC | 2 / 16 | 13 | 3.24E-06 | 4.13E-06 | 2.50E-06 | 5.30E-03 | 9.98E-04 | | | Y |
| delta-BHC | 1 / 10 | 10 | 4.00E-06 | 4.00E-06 | 3.40E-06 | 5.00E-05 | 6.59E-06 | | | Y |
| gamma-BHC (Lindane) | 1 / 16 | 6 | 4.93E-06 | 4.93E-06 | 2.50E-06 | 7.20E-03 | 1.35E-03 | | | Y |
| Isodrin | 4 / 15 | 27 | 6.42E-06 | 1.46E-05 | 2.50E-06 | 7.80E-03 | 2.34E-03 | | | Y |
| **Volatile Organics** | | | | | | | | | | |
| 4-Methyl-2-pentanone | 1 / 13 | 8 | 5.40E-03 | 5.40E-03 | 1.40E-03 | 5.00E-03 | 1.48E-03 | | | Y |
| Acetone | 3 / 10 | 30 | 1.00E-01 | 1.00E-01 | 8.00E-03 | 8.00E-03 | 3.28E-02 | | | Y |
| **Explosives** | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 1 / 13 | 8 | 3.08E-04 | 3.08E-04 | 2.00E-04 | 2.10E-04 | 1.19E-04 | | | Y |
| Nitroglycerine | 1 / 7 | 14 | 2.77E-03 | 2.77E-03 | 1.49E-03 | 1.49E-03 | 1.03E-03 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical inform

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

Some samples were excluded due to rejected data.

## Table C2-16

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 79, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | |
| Beryllium | 6.24E-03 | 3.13E-03 | Y | NA | NA | L | 3.77E-03 | 3.77E-03 |
| Boron | 2.71E-01 | 1.41E-01 | Y | NA | NA | NP | 2.00E-01 | 2.00E-01 |
| Chromium | 2.28E-02 | 4.69E-03 | Y | NA | NA | NP | 1.64E-02 | 1.64E-02 |
| Lead | 4.69E-02 | 1.50E-02 | Y | NA | NA | NP | 2.45E-02 | 2.45E-02 |
| **Semivolatile Organics** | | | | | | | | |
| Di-n-butyl phthalate | 6.20E-03 | 1.48E-01 | N | NA | NA | | | |
| **Pesticides** | | | | | | | | |
| 4,4'-DDE | 8.46E-06 | NA | NA | 1.36E-04 | N | | | |
| Aldrin | 1.72E-05 | 4.67E-05 | N | 3.92E-06 | Y | NP | 6.25E-03 | 1.72E-05 |
| alpha-BHC | 4.13E-06 | NA | NA | 1.03E-05 | N | | | |
| delta-BHC | 4.00E-06 | 4.49E-04 | N | NA | NA | | | |
| gamma-BHC (Lindane) | 4.93E-06 | 4.60E-04 | N | 5.03E-05 | N | | | |
| Isodrin | 1.46E-05 | 4.48E-05 | N | NA | NA | | | |
| **Volatile Organics** | | | | | | | | |
| 4-Methyl-2-pentanone | 5.40E-03 | 5.84E-02 | N | NA | NA | | | |
| Acetone | 1.00E-01 | 1.56E-01 | N | NA | NA | | | |
| **Explosives** | | | | | | | | |
| 1,3,5-Trinitrobenzene | 3.08E-04 | 4.69E-02 | N | NA | NA | | | |
| Nitroglycerine | 2.77E-03 | NA | NA | 4.78E-03 | N | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C2-17

## Cancer Risk and Noncancer Hazard Estimates for the Resident Exposed to Groundwater Parcel 79, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Beryllium | 3.77E-03 | 1.21E-01 | NA |
| Boron | 2.00E-01 | 1.42E-01 | NA |
| Chromium | 1.64E-02 | 3.49E-01 | NA |
| Lead | 2.45E-02 | NA | NA |
| **Pesticides** | | | |
| Aldrin | 1.72E-05 | NA | 4.39E-06 |
| **Total HI / ILCR** | | **6.11E-01** | **4.39E-06** |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C2-18

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcel 79, Fort McClellan, Alabama

| Medium | Resident | | Recreational Site User | |
|---|---|---|---|---|
| | HI | ILCR | HI | ILCR |
| Surface Soil | 1.09E+01 | 2.27E-04 | NA | 2.82E-06 |
| Groundwater | 6.11E-01 | 4.39E-06 | | |
| Surface Water | NA | NA | NA | NA |
| Sediment | NA | NA | NA | NA |
| **Total HI / ILCR** | **1.15E+01** | **2.31E-04** | **NA** | **2.82E-06** |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C3-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 80, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| OLF-S11 | UB02104 | 17-Apr-1994 | 0.5 - 2.5 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S20 | UB01952 | 14-Apr-1994 | 0.6 - 2.6 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S21 | UB01953 | 14-Apr-1994 | 0.8 - 2.8 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S22 | UB01954 | 14-Apr-1994 | 0.4 - 2.4 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S23 | UB01956 | 14-Apr-1994 | 0.3 - 2.3 | Metals, SVOCs, VOCs, Exp, Pest |

SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds
Exp = Explosives
Pest = Pesticides
ft = feet

## Table C3-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 80, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 5 / 5 | 100 | 2.44E+04 | 6.51E+04 | NA | NA | 4.07E+04 | 1.63E+04 | 2.14E+04 | Y |
| Arsenic | 3 / 5 | 60 | 3.53E+00 | 8.20E+00 | 2.50E+00 | 2.50E+00 | 4.07E+00 | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 5 / 5 | 100 | 6.52E+01 | 1.98E+02 | NA | NA | 1.17E+02 | 1.24E+02 | 1.94E+02 | Y |
| Beryllium | 5 / 5 | 100 | 7.46E-01 | 2.43E+00 | NA | NA | 1.31E+00 | 8.00E-01 | 8.68E-01 | Y |
| Boron | 5 / 5 | 100 | 1.75E+01 | 2.80E+01 | NA | NA | 2.27E+01 | | | Y |
| Calcium | 5 / 5 | 100 | 3.06E+02 | 6.61E+03 | NA | NA | 2.91E+03 | 1.72E+03 | 3.54E+03 | N (d) |
| Chromium | 5 / 5 | 100 | 2.76E+01 | 6.78E+01 | NA | NA | 3.79E+01 | 3.70E+01 | 6.44E+01 | Y |
| Cobalt | 5 / 5 | 100 | 3.07E+00 | 2.08E+01 | NA | NA | 1.03E+01 | 1.52E+01 | 3.25E+01 | N (b) |
| Copper | 5 / 5 | 100 | 1.38E+01 | 2.95E+01 | NA | NA | 2.18E+01 | 1.27E+01 | 2.25E+01 | Y |
| Iron | 5 / 5 | 100 | 2.47E+04 | 5.10E+04 | NA | NA | 3.63E+04 | 3.42E+04 | 5.54E+04 | N (b) |
| Lead | 5 / 5 | 100 | 1.71E+01 | 4.00E+01 | NA | NA | 2.89E+01 | 4.01E+01 | 6.38E+01 | N (a) |
| Magnesium | 5 / 5 | 100 | 2.56E+03 | 4.30E+03 | NA | NA | 3.15E+03 | 1.03E+03 | 9.60E+03 | N (b) |
| Manganese | 5 / 5 | 100 | 3.13E+01 | 3.90E+03 | NA | NA | 1.05E+03 | 1.58E+03 | 4.66E+03 | N (b) |
| Mercury | 1 / 5 | 20 | 9.25E-02 | 9.25E-02 | 5.00E-02 | 5.00E-02 | 3.85E-02 | 8.00E-02 | 3.22E-01 | N (b) |
| Nickel | 5 / 5 | 100 | 8.74E+00 | 4.16E+01 | NA | NA | 1.85E+01 | 1.03E+01 | 2.00E+01 | Y |
| Potassium | 5 / 5 | 100 | 3.21E+03 | 5.55E+03 | NA | NA | 4.18E+03 | 8.00E+02 | 6.01E+03 | N (b) |
| Sodium | 5 / 5 | 100 | 5.98E+01 | 1.04E+02 | NA | NA | 8.10E+01 | 6.34E+02 | 5.63E+02 | N(a) |
| Thallium | 1 / 5 | 20 | 1.38E+02 | 1.38E+02 | 3.43E+01 | 3.43E+01 | 4.13E+01 | 3.43E+00 | 4.53E-01 | Y |
| Vanadium | 5 / 5 | 100 | 3.71E+01 | 8.03E+01 | NA | NA | 5.54E+01 | 5.88E+01 | 9.94E+01 | N (b) |
| Zinc | 5 / 5 | 100 | 2.05E+01 | 1.19E+02 | NA | NA | 5.57E+01 | 4.06E+01 | 7.37E+01 | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Benzo(a)anthracene | 2 / 5 | 40 | 1.20E-01 | 1.60E-01 | 4.10E-02 | 4.10E-02 | 6.83E-02 | | | Y |
| Chrysene | 2 / 5 | 40 | 8.30E-02 | 9.10E-02 | 3.20E-02 | 3.20E-02 | 4.44E-02 | | | Y |
| Fluoranthene | 2 / 5 | 40 | 1.20E-01 | 1.90E-01 | 3.20E-02 | 3.20E-02 | 7.16E-02 | | | Y |
| Phenanthrene | 1 / 5 | 20 | 8.70E-02 | 8.70E-02 | 3.20E-02 | 3.20E-02 | 3.02E-02 | | | Y |
| Pyrene | 2 / 5 | 40 | 2.10E-01 | 3.00E-01 | 8.30E-02 | 8.30E-02 | 1.27E-01 | | | Y |
| **Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 2 / 5 | 40 | 4.08E-03 | 1.39E-02 | 6.80E-02 | 6.80E-02 | 2.40E-02 | | | Y |
| Chlordane | 1 / 5 | 20 | 5.68E-01 | 5.68E-01 | 6.80E-01 | 6.80E-01 | 3.86E-01 | | | Y |
| Endosulfan II | 1 / 5 | 20 | 2.15E-03 | 2.15E-03 | 2.40E+00 | 2.40E+00 | 9.60E-01 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/kg = milligrams per kilogram
NA = not available

[a] Surface soil is defined as soil from 0.5 to 2.8 feet below ground surface.

[b] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:
- N (a) = maximum detected concentration does not exceed background screening criterion.
- N (b) = maximum detected concentration does not exceed the upper tolerance limit.
- N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
- N (d) = essential nutrient.
- N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C3-3

### Selection of Chemicals of Potential Concern for Surface Soil[a]
### Parcel 80, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | | Statistical Distribution[b] | 95% UCL[c] (mg/kg) | Source-Term Concentration[d] (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? | | | |
| **Metals** | | | | | | | | | | | | |
| Aluminum | 6.51E+04 | 7.80E+03 | Y | NA | NA | 6.27E+05 | N | NA | NA | L | 7.05E+04 | 6.51E+04 |
| Barium | 1.98E+02 | 5.47E+02 | N | NA | NA | 4.41E+04 | N | NA | NA | | | |
| Beryllium | 2.43E+00 | 9.60E+00 | N | NA | NA | 4.08E+02 | N | NA | NA | | | |
| Boron | 2.80E+01 | 7.03E+02 | N | NA | NA | 5.67E+04 | N | NA | NA | | | |
| Chromium | 6.78E+01 | 2.32E+01 | Y | NA | NA | 1.82E+03 | N | NA | NA | NP | 7.15E+01 | 6.78E+01 |
| Copper | 2.95E+01 | 3.13E+02 | N | NA | NA | 2.52E+04 | N | NA | NA | | | |
| Nickel | 4.16E+01 | 1.54E+02 | N | NA | NA | 1.20E+04 | N | NA | NA | | | |
| Thallium | 1.38E+02 | 5.08E-01 | Y | NA | NA | 4.10E+01 | Y | NA | NA | NP | 1.49E+02 | 1.38E+02 |
| Zinc | 1.19E+02 | 2.34E+03 | N | NA | NA | 1.88E+05 | N | NA | NA | | | |
| **Semivolatile Organic Compounds** | | | | | | | | | | | | |
| Benzo(a)anthracene | 1.60E-01 | NA | NA | 8.51E-01 | N | NA | NA | 5.81E+01 | N | | | |
| Chrysene | 9.10E-02 | NA | NA | 8.61E+01 | N | NA | NA | 5.90E+03 | N | | | |
| Fluoranthene | 1.90E-01 | 3.09E+02 | N | NA | NA | 2.43E+04 | N | NA | NA | | | |
| Phenanthrene | 8.70E-02 | 2.32E+03 | N | NA | NA | 1.82E+05 | N | NA | NA | | | |
| Pyrene | 3.00E-01 | 2.33E+02 | N | NA | NA | 1.85E+04 | N | NA | NA | | | |
| **Pesticides** | | | | | | | | | | | | |
| 4,4'-DDE | 1.39E-02 | NA | NA | 1.79E+00 | N | NA | NA | 1.22E+02 | N | | | |
| Chlordane | 5.68E-01 | 3.79E+00 | N | 1.69E+00 | N | 2.84E+02 | N | 1.14E+02 | N | | | |
| Endosulfan II | 2.15E-03 | 4.66E+01 | N | NA | NA | 3.69E+03 | N | NA | NA | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
UCL = Upper confidence limit
mg/kg = milligrams per kilogram
NA = not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as soil from 0.5 to 2.8 feet below ground surface.
[b] Statistical distribution testing performed only for COPC:
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[c] 95% UCL calculated only for COPC with at least 5 samples.
[d] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C3-4

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Surface Soil[a]
## Parcel 80, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/kg) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Aluminum | 6.51E+04 | 8.34E-01 | NA |
| Chromium | 6.78E+01 | 2.93E-01 | NA |
| Thallium | 1.38E+02 | 2.72E+01 | NA |
| **Total HI / ILCR** | | **2.83E+01** | **NA** |

[a] Surface soil is defined as soil from 0.5 to 2.8 feet below ground surface.
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = not applicable
mg/kg = milligrams per kilogram

## Table C3-5

## Separation of Noncancer Hazard by Target Organ for Resident Parcel 80, Fort McClellan, Alabama

| COPC | Nervous System | Skin | Liver | Kidney | ND |
|---|---|---|---|---|---|
| ***For Surface Soil:*** | | | | | |
| Aluminum | 8.34E-01 | | | | 2.93E-01 |
| Chromium | | | | | |
| Thallium | | 2.72E+01 | 2.72E+01 | | |
| ***For Groundwater:*** | | | | | |
| Acetone | | | 3.65E-01 | 3.65E-01 | |
| Trichloroethene | | | 4.23E-01 | 4.23E-01 | |
| 1,1,2,2-Tetrachloroethane | | | 1.57E-01 | | |
| **Resident HI by Target Organ:** | 8.34E-01 | 2.72E+01 | 2.81E+01 | 7.88E-01 | 2.93E-01 |

COPC = Chemical of potential concern
ND = No data
* See Toxicological Profiles for data regarding selection of target organs.

## Table C3-6

## Remedial Goal Options Based on Noncancer for Resident
## Surface Soil
## Parcel 80, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/kg) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/kg) Based on an HI of: 0.1 | 1 | 3 |
|---|---|---|---|---|---|
| **Metals** | | | | | |
| Thallium | 1.38E+02 | 2.72E+01 | 5.08E-01 | 5.08E+00 | 1.52E+01 |

COC = Chemical of concern
HI = Hazard index
mg/kg = milligrams per kilogram

## Table C3-7

## Cancer Risk and Noncancer Hazard Estimates for Recreational Site User Exposed to Surface Soil[a]
## Parcel 80, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/kg) | Total Noncancer Hazard / Cancer Risk Recreational Site User HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Thallium | 1.38E+02 | 3.37E-01 | NA |
| **Total HI / ILCR** | | **3.37E-01** | **NA** |

[a] Surface soil is defined as soil from 0.5 to 2.8 feet below ground surface.
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/kg = milligrams per kilogram

## Table C3-8

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 80, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| OLF-W01 | MCSAW*20 | 9-Jun-1992 | CAB |
| OLF-W01 | UOP011 | 9-Jun-1992 | CAB, Herb, Pest, SVOCs |
| OLF-W01 | UOQ012 | 9-Jun-1992 | Pesticides |
| OLF-W01 | UOX018 | 9-Jun-1992 | Metals |
| OLF-W01 | UOZ015 | 9-Jun-1992 | Metals |
| OLF-W01 | UPB018 | 9-Jun-1992 | Metals |
| OLF-W01 | UPC015 | 9-Jun-1992 | Explosives |
| OLF-W01 | UPD018 | 9-Jun-1992 | Metals |
| OLF-W01 | UPI003 | 9-Jun-1992 | VOCs |
| OLF-W02 | UB03941 | 14-Jun-1994 | CAB, SVOCs, VOCs, Exp, Metals, Herb, Pest |
| OLF-W02 | UB04481 | 1-Jul-1994 | Explosives |
| OLF-W03 | UB04949 | 18-Jul-1994 | CAB, SVOCs, VOCs, Exp, Metals, Herb, Pest |
| OLF-W04 | UB04950 | 18-Jul-1994 | CAB, SVOCs, VOCs, Exp, Metals, Herb, Pest |
| OLF-W05 | UB04177 | 20-Jun-1994 | CAB, SVOCs, VOCs, Exp, Metals, Herb, Pest |

CAB = Chemical Agent Breakdown
Herb = Herbicides
Pest = Pesticides
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds
Exp = Explosives

## Table C3-9

## Selection of Site-Related Chemicals for Surface Water
## Parcel 80, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 4 / 5 | 80 | 5.44E-01 | 1.62E+00 | 1.12E-01 | NA | 9.30E-01 | 5.26E+00 | 1.70E+01 | N (a) |
| Barium | 5 / 5 | 100 | 2.78E-02 | 4.34E-02 | NA | NA | 3.30E-02 | 7.54E-02 | 1.13E-01 | N (a) |
| Boron | 1 / 5 | 20 | 2.50E-01 | 2.50E-01 | 2.30E-01 | NA | 1.42E-01 | | | Y |
| Calcium | 5 / 5 | 100 | 6.97E+00 | 1.93E+01 | NA | NA | 1.29E+01 | 2.52E+01 | 6.41E+01 | N (a) |
| Iron | 5 / 5 | 100 | 4.26E-01 | 7.93E+00 | NA | NA | 3.36E+00 | 1.96E+01 | 4.12E+01 | N (a) |
| Lead | 1 / 5 | 20 | 7.08E-02 | 7.08E-02 | 4.47E-03 | NA | 1.98E-02 | 8.67E-03 | 4.73E-02 | N (e) |
| Magnesium | 5 / 5 | 100 | 2.45E+00 | 8.76E+00 | NA | NA | 4.86E+00 | 1.10E+01 | 2.44E+01 | N (a) |
| Manganese | 5 / 5 | 100 | 2.51E-02 | 4.64E-01 | NA | NA | 1.79E-01 | 5.65E-01 | 1.83E+00 | N (a) |
| Potassium | 4 / 5 | 80 | 2.08E+00 | 3.71E+00 | 1.24E+00 | NA | 2.59E+00 | 2.56E+00 | 4.25E+00 | N (d) |
| Sodium | 5 / 5 | 100 | 1.10E+00 | 1.01E+01 | NA | NA | 3.66E+00 | 3.44E+00 | 1.52E+01 | N (d) |
| Zinc | 2 / 5 | 40 | 1.90E-02 | 2.19E-02 | 1.80E-02 | NA | 1.36E-02 | 4.04E-02 | 1.82E-01 | N (a) |
| **Pesticides** | | | | | | | | | | |
| alpha-BHC | 2 / 6 | 33 | 3.48E-06 | 5.18E-06 | 2.50E-06 | NA | 1.33E-03 | | | Y |
| gamma-BHC (Lindane) | 1 / 6 | 17 | 4.13E-06 | 4.13E-06 | 2.50E-06 | NA | 1.80E-03 | | | Y |
| Isodrin | 2 / 6 | 33 | 4.67E-06 | 2.05E-05 | 7.80E-03 | NA | 2.60E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 1,1,1-Trichloroethane | 2 / 5 | 40 | 1.20E-03 | 6.20E-03 | 1.00E-03 | NA | 1.78E-03 | | | Y |
| Trichloroethene | 1 / 5 | 20 | 1.30E-03 | 1.30E-03 | 1.00E-03 | NA | 6.60E-04 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/L = milligrams per liter
NA = not available
[a] Background criterion for inorganic constituents is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C3-10

## Selection of Chemicals of Potential Concern for Surface Water
## Parcel 80, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Boron | 2.50E-01 | 1.42E+00 | N | NA | NA | 1.42E+00 | N | NA | NA |
| **Pesticides** | | | | | | | | | |
| alpha-BHC | 5.18E-06 | NA | NA | 1.55E-04 | N | NA | NA | 1.55E-04 | N |
| gamma-BHC (Lindane) | 4.13E-06 | 4.26E-03 | N | 7.65E-04 | N | 4.26E-03 | N | 7.65E-04 | N |
| Isodrin | 2.05E-05 | 4.62E-04 | N | 6.34E-05 | N | 4.62E-04 | N | 6.34E-05 | N |
| **Volatile Organic Compounds** | | | | | | | | | |
| 1,1,1-Trichloroethane | 6.20E-03 | 2.78E+00 | N | NA | NA | 2.78E+00 | N | NA | NA |
| Trichloroethene | 1.30E-03 | 8.30E-02 | N | 8.80E-02 | N | 8.30E-02 | N | 8.80E-02 | N |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).

COPC = Chemical of potential concern

mg/L = milligrams per liter

NA = not applicable

N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C3-11

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 80, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| OLF-D01 | MCSAS*69 | 9-Jun-1992 | NA - NA | CAB |
| OLF-D01 | UOV012 | 9-Jun-1992 | NA - NA | Explosives |
| OLF-D01 | UPK002 | 9-Jun-1992 | 0 - 0.5 | SVOCs & Pesticides |
| OLF-D01 | UPL003 | 9-Jun-1992 | 0 - 0.5 | Pesticides |
| OLF-D01 | UPM005 | 9-Jun-1992 | 0 - 0.5 | Metals |
| OLF-D01 | UPN005 | 9-Jun-1992 | NA - NA | Metals |
| OLF-D01 | UPO005 | 9-Jun-1992 | NA - NA | Metals |
| OLF-D01 | UPP005 | 9-Jun-1992 | 0 - 0.5 | Metals |
| OLF-D01 | UPQ002 | 9-Jun-1992 | NA - NA | SVOCs & VOCs |
| OLF-D02 | UB01957 | 14-Apr-1994 | 0 - 0.5 | SVOCs, VOCs, Metals, Pest, Exp |
| OLF-D03 | UB01958 | 14-Apr-1994 | 0.4 - 0.9 | SVOCs, VOCs, Metals, Pest, Exp |

CAB = Chemical Agent Breakdown
Exp = Explosives
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds
Pest = Pesticides

## Table C3-12

## Selection of Site-Related Chemicals for Sediment
## Parcel 80, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 2.63E+03 | 6.08E+04 | NA | NA | 2.35E+04 | 8.59E+03 | 1.43E+04 | Y |
| Arsenic | 2 / 4 | 50 | 3.43E+00 | 4.48E+00 | 2.50E+00 | 1.64E+01 | 4.34E+00 | 1.13E+01 | 2.01E+01 | N (a) |
| Barium | 3 / 3 | 100 | 1.25E+01 | 1.58E+02 | NA | NA | 6.93E+01 | 9.89E+01 | 1.91E+02 | N (b) |
| Beryllium | 2 / 3 | 67 | 7.56E-01 | 1.87E+00 | 4.27E-01 | 4.27E-01 | 9.47E-01 | 9.70E-01 | 1.24E+00 | Y |
| Boron | 2 / 3 | 67 | 1.29E+01 | 3.60E+01 | 6.64E+00 | 6.64E+00 | 1.74E+01 | | | Y |
| Calcium | 3 / 3 | 100 | 4.73E+02 | 7.86E+03 | NA | NA | 3.17E+03 | 1.11E+03 | 2.81E+03 | N (d) |
| Chromium | 3 / 3 | 100 | 1.18E+01 | 4.22E+01 | NA | NA | 2.23E+01 | 3.12E+01 | 6.33E+01 | N (b) |
| Cobalt | 2 / 3 | 67 | 5.12E+00 | 8.93E+00 | 2.50E+00 | 2.50E+00 | 5.10E+00 | 1.10E+01 | 2.19E+01 | N (a) |
| Copper | 3 / 3 | 100 | 7.46E+00 | 2.49E+01 | NA | NA | 1.41E+01 | 1.71E+01 | 3.68E+01 | N (b) |
| Iron | 3 / 3 | 100 | 1.16E+04 | 3.75E+04 | NA | NA | 2.36E+04 | 3.53E+04 | 5.19E+04 | N (b) |
| Lead | 2 / 3 | 67 | 7.54E+00 | 2.90E+01 | 7.44E+00 | 7.44E+00 | 1.34E+01 | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 3 / 3 | 100 | 7.66E+02 | 4.20E+03 | NA | NA | 2.45E+03 | 9.06E+02 | 2.20E+03 | N (d) |
| Manganese | 3 / 3 | 100 | 7.30E+01 | 3.61E+02 | NA | NA | 2.12E+02 | 7.12E+02 | 2.05E+03 | N (a) |
| Nickel | 3 / 3 | 100 | 4.91E+00 | 2.10E+01 | NA | NA | 1.05E+01 | 1.30E+01 | 3.16E+01 | N (b) |
| Potassium | 2 / 3 | 67 | 9.96E+02 | 8.18E+03 | 1.31E+02 | 1.31E+02 | 3.08E+03 | 1.01E+03 | 2.79E+03 | N (d) |
| Sodium | 2 / 3 | 67 | 8.82E+01 | 1.23E+02 | 3.87E+01 | 3.87E+01 | 7.69E+01 | 6.92E+02 | 7.38E+02 | N (a) |
| Vanadium | 3 / 3 | 100 | 9.68E+00 | 7.74E+01 | NA | NA | 3.52E+01 | 4.09E+01 | 6.67E+01 | Y |
| Zinc | 3 / 3 | 100 | 2.57E+01 | 7.43E+01 | NA | NA | 4.30E+01 | 5.27E+01 | 1.11E+02 | N (b) |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Acenaphthylene | 1 / 3 | 33 | 8.00E-02 | 8.00E-02 | 3.30E-02 | 3.30E-02 | 3.77E-02 | | | Y |
| Benzo(a)anthracene | 1 / 3 | 33 | 8.00E-01 | 8.00E-01 | 4.10E-02 | 4.10E-02 | 2.80E-01 | | | Y |
| Benzo(b)fluoranthene | 1 / 3 | 33 | 9.20E-01 | 9.20E-01 | 3.10E-01 | 3.10E-01 | 4.10E-01 | | | Y |
| Benzo(ghi)perylene | 1 / 3 | 33 | 3.90E-01 | 3.90E-01 | 1.80E-01 | 1.80E-01 | 1.90E-01 | | | Y |
| Benzo(k)fluoranthene | 1 / 3 | 33 | 4.80E-01 | 4.80E-01 | 1.30E-01 | 1.30E-01 | 2.03E-01 | | | Y |
| Chrysene | 1 / 3 | 33 | 6.30E-01 | 6.30E-01 | 3.20E-02 | 3.20E-02 | 2.21E-01 | | | Y |
| Fluoranthene | 1 / 3 | 33 | 8.90E-01 | 8.90E-01 | 3.20E-02 | 3.20E-02 | 3.07E-01 | | | Y |
| Phenanthrene | 1 / 3 | 33 | 2.30E-01 | 2.30E-01 | 3.20E-02 | 3.20E-02 | 8.73E-02 | | | Y |
| Pyrene | 1 / 3 | 33 | 1.20E+00 | 1.20E+00 | 8.30E-02 | 8.30E-02 | 4.28E-01 | | | Y |
| **Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 1 / 4 | 25 | 3.79E-03 | 3.79E-03 | 2.70E-03 | 6.80E-02 | 1.83E-02 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/kg = milligrams per kilogram
NA = not available
[a] Background criterion for inorganic constituents is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C3-13

## Selection of Chemicals of Potential Concern for Sediment
## Parcel 80, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Aluminum | 6.08E+04 | 1.15E+06 | N | NA | NA | 1.15E+06 | N | NA | NA |
| Beryllium | 1.87E+00 | 1.50E+02 | N | NA | NA | 1.50E+02 | N | NA | NA |
| Boron | 3.60E+01 | 1.08E+05 | N | NA | NA | 1.08E+05 | N | NA | NA |
| Vanadium | 7.74E+01 | 4.83E+03 | N | NA | NA | 4.83E+03 | N | NA | NA |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Acenaphthylene | 8.00E-02 | 5.59E+04 | N | NA | NA | 5.59E+04 | N | NA | NA |
| Benzo(a)anthracene | 8.00E-01 | NA | NA | 8.93E+01 | N | NA | NA | 8.93E+01 | N |
| Benzo(b)fluoranthene | 9.20E-01 | NA | NA | 8.93E+01 | N | NA | NA | 8.93E+01 | N |
| Benzo(ghi)perylene | 3.90E-01 | 2.79E+04 | N | NA | NA | 2.79E+04 | N | NA | NA |
| Benzo(k)fluoranthene | 4.80E-01 | NA | NA | 8.93E+02 | N | NA | NA | 8.93E+02 | N |
| Chrysene | 6.30E-01 | NA | NA | 9.79E+03 | N | NA | NA | 9.79E+03 | N |
| Fluoranthene | 8.90E-01 | 3.73E+04 | N | NA | NA | 3.73E+04 | N | NA | NA |
| Phenanthrene | 2.30E-01 | 2.79E+05 | N | NA | NA | 2.79E+05 | N | NA | NA |
| Pyrene | 1.20E+00 | 3.06E+04 | N | NA | NA | 3.06E+04 | N | NA | NA |
| **Pesticides** | | | | | | | | | |
| 4,4'-DDE | 3.79E-03 | NA | NA | 1.66E+02 | N | NA | NA | 1.66E+02 | N |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
mg/kg = milligrams per kilogram
NA = not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C3-14

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 80, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| OLF-G01 | A-0012 | 15-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G02 | A-0013 | 16-Feb-1998 | Expl, SVOCs, VOCs, Metals |
| OLF-G03 | A-0014 | 16-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G04 | A-0017 | 13-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G05 | A-0018 | 14-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G07 | A-0020 | 14-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G08 | A-0023 | 14-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G09 | A-0024 | 12-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G10 | A-0025 | 16-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G11 | A-0026 | 18-Feb-1998 | Expl, SVOCs, VOCs, Metals |
| OLF-G12 | A-0027 | 15-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G13 | A-0028 | 17-Feb-1998 | Expl, SVOCs, VOCs, Metals |
| OLF-G15 | A-0029 | 13-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G17 | A-0031 | 14-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G18 | A-0032 | 15-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |
| OLF-G19 | A-0033 | 15-Feb-1998 | Expl, SVOCs, VOCs, Metals, Pest/PCBs |

Expl - Explosives
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
Pest/PCBs - Pesticides and Polychlorinated biphenyls

## Table C3-15

## Selection of Site-Related Chemicals for Groundwater
## Parcel 80, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Site-Related?[a] |
|---|---|---|---|---|---|---|---|---|
| **Pesticides & PCBs** | | | | | | | | |
| beta-BHC | 1 / 13 | 8 | 5.40E-05 | 5.40E-05 | 5.00E-05 | 5.00E-05 | 2.72E-05 | Y |
| **Semivolatile Organic Compounds** | | | | | | | | |
| 4-Chloroaniline | 1 / 16 | 6 | 1.80E-03 | 1.80E-03 | 1.00E-02 | 1.00E-02 | 4.80E-03 | Y |
| bis(2-Ethylhexyl)phthalate | 1 / 16 | 6 | 2.60E-03 | 2.60E-03 | 1.00E-02 | 1.00E-02 | 4.85E-03 | Y |
| Diethyl phthalate | 1 / 16 | 6 | 1.60E-03 | 1.60E-03 | 1.00E-02 | 1.00E-02 | 4.79E-03 | Y |
| Di-n-butyl phthalate | 15 / 16 | 94 | 1.90E-03 | 6.90E-03 | 1.00E-02 | 1.00E-02 | 4.14E-03 | Y |
| **Volatile Organic Compounds** | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 2 / 16 | 13 | 9.20E-02 | 4.00E-01 | 1.00E-03 | 2.50E-02 | 3.19E-02 | Y |
| 1,1,2-Trichloroethane | 2 / 16 | 13 | 9.30E-04 | 3.10E-03 | 1.00E-03 | 2.50E-02 | 1.44E-03 | Y |
| 1,1-Dichloroethane | 1 / 16 | 6 | 4.20E-03 | 4.20E-03 | 1.00E-03 | 2.50E-02 | 1.79E-03 | Y |
| 1,2-Dichloroethene | 3 / 16 | 19 | 2.10E-03 | 2.00E-02 | 1.00E-03 | 2.50E-02 | 2.93E-03 | Y |
| Acetone | 1 / 1 | 100 | 5.70E-01 | 5.70E-01 | 2.50E-01 | 2.50E-01 | 5.70E-01 | Y |
| Benzene | 1 / 16 | 6 | 9.10E-04 | 9.10E-04 | 1.00E-03 | 2.50E-02 | 1.59E-03 | Y |
| Carbon disulfide | 7 / 16 | 44 | 3.30E-04 | 3.00E-03 | 1.00E-03 | 2.50E-02 | 1.86E-03 | Y |
| Chlorobenzene | 3 / 16 | 19 | 1.50E-04 | 1.60E-03 | 1.00E-03 | 2.50E-02 | 1.57E-03 | Y |
| Tetrachloroethene | 4 / 16 | 25 | 3.60E-04 | 1.70E-03 | 1.00E-03 | 2.50E-02 | 1.35E-03 | Y |
| Trichloroethene | 4 / 16 | 25 | 1.60E-04 | 1.00E-01 | 1.00E-03 | 2.50E-02 | 9.77E-03 | Y |
| Xylene, Total | 1 / 16 | 6 | 3.10E-04 | 3.10E-04 | 1.00E-03 | 2.50E-02 | 1.55E-03 | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/L = milligrams per liter
[a] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C3-16

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 80, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration[c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Pesticides & PCBs** | | | | | | | | |
| beta-BHC | 5.40E-05 | NA | NA | 3.61E-05 | Y | NP | 3.72E-05 | 3.72E-05 |
| **Semivolatile Organic Compounds** | | | | | | | | |
| 4-Chloroaniline | 1.80E-03 | 6.20E-03 | N | NA | NA | | | |
| bis(2-Ethylhexyl)phthalate | 2.60E-03 | 2.85E-02 | N | 4.31E-03 | N | | | |
| Diethyl phthalate | 1.60E-03 | 1.23E+00 | N | NA | NA | | | |
| Di-n-butyl phthalate | 6.90E-03 | 1.48E-01 | N | NA | NA | | | |
| **Volatile Organic Compounds** | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 4.00E-01 | 9.21E-02 | Y | 2.04E-04 | Y | NP | 1.45E-01 | 1.45E-01 |
| 1,1,2-Trichloroethane | 3.10E-03 | 6.18E-03 | N | 7.15E-04 | Y | NP | 4.81E-03 | 3.10E-03 |
| 1,1-Dichloroethane | 4.20E-03 | 1.54E-01 | N | NA | NA | | | |
| 1,2-Dichloroethene | 2.00E-02 | 1.39E-02 | Y | NA | NA | NP | 9.16E-03 | 9.16E-03 |
| Acetone | 5.70E-01 | 1.56E-01 | Y | NA | NA | | | 5.70E-01 |
| Benzene | 9.10E-04 | 3.96E-03 | N | 1.41E-03 | N | | | |
| Carbon disulfide | 3.00E-03 | 1.51E-01 | N | NA | NA | | | |
| Chlorobenzene | 1.60E-03 | 1.62E-02 | N | NA | NA | | | |
| Tetrachloroethene | 1.70E-03 | 1.46E-02 | N | 1.26E-03 | Y | NP | 4.69E-03 | 1.70E-03 |
| Trichloroethene | 1.00E-01 | 9.15E-03 | Y | 4.51E-03 | Y | NP | 3.87E-02 | 3.87E-02 |
| Xylene, Total | 3.10E-04 | 2.80E+00 | N | NA | NA | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
mg/L = milligrams per liter
COPC = Chemical of potential concern
UCL = Upper confidence limit
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C3-17

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Groundwater
## Parcel 80, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Pesticides & PCBs** | | | |
| beta-BHC | 3.72E-05 | NA | 1.03E-06 |
| **Volatile Organic Compounds** | | | |
| 1,1,2,2-Tetrachloroethane | 1.45E-01 | 1.57E-01 | 7.09E-04 |
| 1,1,2-Trichloroethane | 3.10E-03 | NA | 4.33E-06 |
| 1,2-Dichloroethene | 9.16E-03 | 6.58E-02 | NA |
| Acetone | 5.70E-01 | 3.65E-01 | NA |
| Tetrachloroethene | 1.70E-03 | NA | 1.35E-06 |
| Trichloroethene | 3.87E-02 | 4.23E-01 | 8.59E-06 |
| **Total HI / ILCR** | | **1.01E+00** | **7.24E-04** |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = not applicable
mg/L = milligrams per liter

## Table C3-18

## Remedial Goal Options Based on Cancer for Resident Groundwater
## Parcel 80, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/L) | MCL[a] (mg/L) | ILCR (all pathways) for COC | Cancer Remedial Goal Options (mg/L) Based on an ILCR of : 1.00E-06 | 1.00E-05 | 1.00E-04 |
|---|---|---|---|---|---|---|
| **Pesticides & PCBs** | | | | | | |
| beta-BHC | 3.72E-05 | ND | 1.03E-06 | 3.61E-05 | 3.61E-04 | 3.61E-03 |
| **Volatile Organic Compounds** | | | | | | |
| 1,1,2,2-Tetrachloroethane | 1.45E-01 | ND | 7.09E-04 | 2.04E-04 | 2.04E-03 | 2.04E-02 |
| 1,1,2-Trichloroethane | 3.10E-03 | 5.00E-03 | 4.33E-06 | 7.15E-04 | 7.15E-03 | 7.15E-02 |
| Tetrachloroethene | 1.70E-03 | 5.00E-03 | 1.35E-06 | 1.26E-03 | 1.26E-02 | 1.26E-01 |
| Trichloroethene | 3.87E-02 | 5.00E-03 | 8.59E-06 | 4.51E-03 | 4.51E-02 | 4.51E-01 |

mg/L = milligrams per liter
COC = Chemical of concern
ILCR = Incremental lifetime cancer risk
MCL = Maximum contaminant level
a = US Environmental Protection Agency, *National Primary Drinking Water Regulations*, March 2001, online.
ND = No data

## Table C3-19

## Remedial Goal Options Based on Noncancer for Resident Groundwater
## Parcel 80, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/L) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/L) Based on an HI of : 0.1 | 1.0 | 3.0 |
|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | |
| Acetone | 5.70E-01 | 3.65E-01 | 1.56E-01 | 1.56E+00 | 4.69E+00 |
| Trichloroethene | 4.23E-01 | 4.23E-01 | 9.15E-03 | 9.15E-02 | 2.74E-01 |
| 1,1,2,2-Tetrachloroethane | 3.87E-02 | 1.57E-01 | 9.21E-02 | 9.21E-01 | 2.76E+00 |

mg/L = milligrams per liter
COC = Chemical of concern
HI = Hazard Index
ND = No data

## Table C3-20

## Selection of Chemicals For Future Groundwater Analysis
## Parcel 80, Fort McClellan, Alabama

| Groundwater Residential COPCs | Total Soil[a] MDC (mg/kg) | Total Soil[a] Background Screening Criterion[b] (mg/kg) | EPA Soil-Screening Level[c] (mg/kg) | Included for Future Groundwater Analyses?[d] | Site-Specific Soil-Screening Level (mg/kg) | ILCR |
|---|---|---|---|---|---|---|
| **Pesticides & PCBs** | | | | | | |
| beta-BHC | 3.70E-03 | NA | 3.00E-03 | Y | 5.43E-05 | 6.81E-05 |
| **Semivolatile Organic Compounds** | | | | | | |
| 4-Chloroaniline | NA | NA | NA | N (c) | | |
| bis(2-Ethylhexyl)phthalate | 3.10E+00 | NA | 3.60E+03 | N (b) | | |
| Diethyl phthalate | NA | NA | NA | N (c) | | |
| Di-n-butyl phthalate | NA | NA | NA | N (c) | | |
| **Volatile Organic Compounds** | | | | | | |
| 1,1,2,2-Tetrachloroethane | NA | NA | NA | N (c) | | |
| 1,1,2-Trichloroethane | NA | NA | NA | N (c) | | |
| 1,1-Dichloroethane | NA | NA | NA | N (c) | | |
| 1,2-Dichloroethene | NA | NA | NA | N (c) | | |
| Acetone | NA | NA | NA | N (c) | | |
| Benzene | 9.20E-03 | NA | 3.00E-02 | N (b) | | |
| Carbon disulfide | 3.30E-03 | NA | 3.20E+01 | N (b) | | |
| Chlorobenzene | NA | NA | NA | N (c) | | |
| Tetrachloroethene | NA | NA | NA | N (c) | | |
| Trichloroethene | NA | NA | NA | N (c) | | |
| Xylene, Total | 2.50E-01 | NA | 1.90E+02 | N (b) | | |

COPC = Chemical of potential concern
ILCR = incremental lifetime cancer risk
MDC = maximum detected concentration
NA = not available
mg/kg = milligrams per kilogram

[a] Total soil is defined as surface soil data and subsurface soil data combined.

[b] Background criterion for metals is 2 times the mean background concentration for surface and subsurface soil (Science Applications International Corporation, 1998, *Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] Based on Soil Screening Level (SSLs) for a dilution attenuation factor of 20 ( EPA, 1996, *Technical Background Document for Soil Screening Guidance*, EPA 540/R-95/128, May)

[d] Rationale for exclusion or inclusion of chemical for future groundwater analyses:

Y = Chemical is selected for future groundwater analysis
N(a) = No, soil MDC within background concentration
N(b) = No, soil MDC is less than SSL
N(c) = No, chemical not detected in soil
N(d) = No, chemical is not included on Table A-1 of the *Soil Screening Guidance* (EPA, 1996)

## Table C3-21

## Total Soil Samples Used in Streamlined Risk Assessment
## Parcel 80, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| OLF-S11 | UB02104 | 17-Apr-94 | 0.5 - 2.5 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S11 | UB02105 | 17-Apr-94 | 18 - 20 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S13 | UB02102 | 16-Apr-94 | 1 - 3 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S13 | UB02103 | 16-Apr-94 | 3 - 5 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S16 | UB02106 | 18-Apr-94 | 1.5 - 3.5 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S16 | UB02107 | 18-Apr-94 | 25 - 27 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S17 | UB04544 | 5-Jul-94 | 1 - 3 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S17 | UB04545 | 5-Jul-94 | 22 - 24 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S20 | UB01952 | 14-Apr-94 | 0.6 - 2.6 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S21 | UB01953 | 14-Apr-94 | 0.8 - 2.8 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S22 | UB01954 | 14-Apr-94 | 0.4 - 2.4 | Metals, SVOCs, VOCs, Exp, Pest |
| OLF-S23 | UB01956 | 14-Apr-94 | 0.3 - 2.3 | Metals, SVOCs, VOCs, Exp, Pest |
| FA-80-SB01 | DD0007 | 27-Mar-00 | 12 - 14 | CL Pest, CL Herb, Metals, OP Pest, Nitro, SVOCs, VOCs, PCBs |
| FA-80-SB02 | DD0008 | 27-Mar-00 | 14 - 16 | CL Pest, CL Herb, Metals, OP Pest, Nitro, SVOCs, VOCs, PCBs |
| FA-80-SB03 | DD0009 | 27-Mar-00 | 20 - 22 | CL Pest, CL Herb, Metals, OP Pest, Nitro, SVOCs, VOCs, PCBs |
| FA-80-SB04 | DD0010 | 23-Mar-00 | 16 - 18 | CL Pest, CL Herb, Metals, OP Pest, Nitro, SVOCs, VOCs, PCBs |
| FA-80-SB05 | DD0011 | 23-Mar-00 | 8 - 10 | CL Pest, CL Herb, Metals, OP Pest, Nitro, SVOCs, VOCs, PCBs |

CL Pest - Chlorinated Pesticides
CL Herb - Chlorinated Herbicides
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinated biphenyls
Exp - Explosives
Nitro - Nitroaromatics

## Table C3-22

### Selection of Site-Related Chemicals for Total Soil[a]
### Parcel 80, Fort McClellan, Alabama

(Page 1 of 2)

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum |
|---|---|---|---|---|---|---|
| **Metals** | | | | | | |
| Aluminum | 17 / 17 | 100 | 7.77E+03 | 6.51E+04 | 2.68E+01 | 1.00E+06 |
| Antimony | 1 / 7 | 14 | 6.50E-01 | 6.50E-01 | 1.00E+00 | 8.40E+00 |
| Arsenic | 11 / 17 | 65 | 1.90E+00 | 8.20E+00 | 1.30E+00 | 1.00E+06 |
| Barium | 17 / 17 | 100 | 9.93E+00 | 1.98E+02 | 2.68E+01 | 1.00E+06 |
| Beryllium | 16 / 17 | 94 | 3.40E-01 | 2.43E+00 | 4.27E-01 | 1.00E+06 |
| Boron | 10 / 12 | 83 | 1.03E+01 | 2.82E+01 | 6.64E+00 | 1.00E+06 |
| Cadmium | 1 / 17 | 6 | 2.70E-01 | 2.70E-01 | 6.70E-01 | 1.20E+00 |
| Calcium | 17 / 17 | 100 | 8.91E+01 | 6.61E+03 | 6.69E+02 | 1.00E+06 |
| Chromium | 17 / 17 | 100 | 1.06E+01 | 6.78E+01 | 1.30E+00 | 1.00E+06 |
| Cobalt | 16 / 17 | 94 | 2.70E+00 | 2.08E+01 | 2.50E+00 | 1.00E+06 |
| Copper | 16 / 17 | 94 | 8.66E+00 | 1.46E+02 | 2.84E+00 | 1.00E+06 |
| Iron | 17 / 17 | 100 | 3.65E+03 | 5.10E+04 | 1.34E+01 | 1.00E+06 |
| Lead | 17 / 17 | 100 | 3.27E+00 | 9.59E+01 | 4.00E-01 | 1.00E+06 |
| Magnesium | 17 / 17 | 100 | 4.78E+02 | 8.22E+03 | 6.69E+02 | 1.00E+06 |
| Manganese | 16 / 17 | 94 | 1.49E+01 | 3.90E+03 | 2.00E+00 | 1.00E+06 |
| Mercury | 5 / 16 | 31 | 9.25E-02 | 6.20E-01 | 4.40E-02 | 5.00E-02 |
| Nickel | 17 / 17 | 100 | 4.29E+00 | 4.16E+01 | 5.40E+00 | 1.00E+06 |
| Potassium | 17 / 17 | 100 | 4.77E+02 | 1.19E+04 | 6.69E+02 | 1.00E+06 |
| Silver | 2 / 17 | 12 | 1.10E+00 | 1.11E+01 | 8.03E-01 | 1.40E+00 |
| Sodium | 9 / 17 | 53 | 5.98E+01 | 1.22E+02 | 3.87E+01 | 1.00E+06 |
| Thallium | 4 / 16 | 25 | 6.60E-01 | 1.38E+02 | 1.30E+00 | 3.43E+01 |
| Vanadium | 17 / 17 | 100 | 1.67E+01 | 8.03E+01 | 6.70E+00 | 1.00E+06 |
| Zinc | 17 / 17 | 100 | 1.23E+01 | 1.19E+02 | 2.70E+00 | 1.00E+06 |
| **Semivolatile Organic Compounds** | | | | | | |
| Anthracene | 1 / 17 | 6 | 1.30E-01 | 1.30E-01 | 4.40E-01 | 7.10E-01 |
| 2-Methylnaphthalene | 1 / 17 | 6 | 6.20E-01 | 6.20E-01 | 3.20E-02 | 4.60E-01 |
| Acenaphthene | 1 / 17 | 6 | 1.30E-01 | 1.30E-01 | 4.10E-02 | 4.60E-01 |
| Benzo(a)anthracene | 3 / 17 | 18 | 1.20E-01 | 1.60E-01 | 4.10E-02 | 4.60E-01 |
| Benzo(a)pyrene | 1 / 17 | 6 | 8.40E-02 | 8.40E-02 | 4.40E-01 | 1.20E+00 |
| Benzo(b)fluoranthene | 1 / 17 | 6 | 1.10E-01 | 1.10E-01 | 3.10E-01 | 4.60E-01 |
| Benzo(ghi)perylene | 1 / 17 | 6 | 4.90E-02 | 4.90E-02 | 1.80E-01 | 4.60E-01 |
| Benzo(k)fluoranthene | 1 / 17 | 6 | 5.70E-02 | 5.70E-02 | 1.30E-01 | 4.60E-01 |
| Benzyl Alcohol | 2 / 12 | 17 | 5.30E-02 | 5.40E-02 | 3.20E-02 | 1.00E+06 |
| bis(2-Ethylhexyl)phthalate | 4 / 16 | 25 | 1.10E+00 | 3.10E+00 | 4.40E-01 | 4.80E-01 |
| Chrysene | 3 / 17 | 18 | 8.30E-02 | 2.00E-01 | 3.20E-02 | 4.60E-01 |
| Dibenzofuran | 1 / 17 | 6 | 9.80E-02 | 9.80E-02 | 3.80E-01 | 4.60E-01 |
| Fluoranthene | 4 / 17 | 24 | 4.90E-02 | 2.40E-01 | 3.20E-02 | 4.60E-01 |
| Fluorene | 1 / 17 | 6 | 2.00E-01 | 2.00E-01 | 6.50E-02 | 4.60E-01 |
| Naphthalene | 6 / 21 | 29 | 2.00E-03 | 7.20E-01 | 6.70E-03 | 7.40E-01 |
| Phenanthrene | 3 / 17 | 18 | 5.50E-02 | 6.00E-01 | 3.20E-02 | 4.60E-01 |
| Pyrene | 4 / 17 | 24 | 5.50E-02 | 3.30E-01 | 8.30E-02 | 4.60E-01 |

## Table C3-22

### Selection of Site-Related Chemicals for Total Soil[a]
### Parcel 80, Fort McClellan, Alabama

(Page 2 of 2)

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum |
|---|---|---|---|---|---|---|
| **Pesticides** | | | | | | |
| 4,4'-DDD | 5 / 17 | 29 | 2.00E-03 | 9.00E-02 | 2.30E-03 | 6.40E-02 |
| 4,4'-DDE | 9 / 17 | 53 | 1.90E-03 | 1.40E-02 | 2.30E-03 | 1.00E+06 |
| 4,4'-DDT | 4 / 17 | 24 | 1.20E-03 | 3.90E-02 | 2.30E-03 | 1.00E-01 |
| Aldrin | 2 / 17 | 12 | 1.70E-03 | 2.00E-03 | 2.30E-03 | 1.30E+00 |
| Aroclor 1242 | 3 / 17 | 18 | 1.10E-01 | 4.10E-01 | 4.40E-02 | 3.20E-01 |
| beta-BHC | 2 / 17 | 12 | 1.50E-03 | 3.70E-03 | 2.30E-03 | 1.30E+00 |
| delta-BHC | 1 / 17 | 6 | 2.10E-03 | 2.10E-03 | 2.30E-03 | 2.10E-01 |
| Chlordane | 4 / 17 | 24 | 3.10E-01 | 5.68E-01 | 2.30E-02 | 6.80E-01 |
| Endosulfan II | 5 / 17 | 29 | 8.80E-04 | 5.30E-03 | 2.30E-03 | 2.40E+00 |
| Endrin | 1 / 17 | 6 | 1.60E-03 | 1.60E-03 | 2.30E-03 | 1.30E+00 |
| gamma-BHC (Lindane) | 3 / 17 | 18 | 6.30E-04 | 1.90E-03 | 2.30E-03 | 1.00E-01 |
| Heptachlor | 4 / 17 | 24 | 9.60E-04 | 3.40E-03 | 2.30E-03 | 2.40E-01 |
| Heptachlor epoxide | 1 / 17 | 6 | 4.60E-03 | 4.60E-03 | 2.30E-03 | 4.80E-01 |
| **Volatile Organic Compounds** | | | | | | |
| 1,2,4-Trimethylbenzene | 5 / 5 | 100 | 2.80E-03 | 7.00E-01 | 6.70E-03 | 1.60E-02 |
| 1,2-Dichlorobenzene | 1 / 22 | 5 | 8.00E-04 | 8.00E-04 | 6.70E-03 | 4.60E-01 |
| 1,2-Dimethylbenzene | 1 / 5 | 20 | 5.50E-02 | 5.50E-02 | 6.70E-03 | 1.60E-02 |
| 1,3,5-Trimethylbenzene | 4 / 5 | 80 | 1.40E-03 | 2.90E-01 | 6.70E-03 | 1.60E-02 |
| 1,4-Dichlorobenzene | 2 / 22 | 9 | 9.80E-04 | 1.30E-03 | 6.70E-03 | 4.60E-01 |
| Benzene | 2 / 17 | 12 | 1.30E-03 | 9.20E-03 | 6.70E-03 | 1.00E-01 |
| Carbon disulfide | 2 / 17 | 12 | 1.80E-03 | 3.30E-03 | 6.70E-03 | 6.00E-01 |
| Chloroform | 1 / 17 | 6 | 2.90E-03 | 2.90E-03 | 6.70E-03 | 2.40E-01 |
| Cumene | 3 / 5 | 60 | 2.30E-03 | 7.00E-02 | 6.70E-03 | 1.60E-02 |
| Ethylbenzene | 1 / 17 | 6 | 2.40E-02 | 2.40E-02 | 6.70E-03 | 1.90E-01 |
| m,p-Xylenes | 2 / 5 | 40 | 2.20E-03 | 2.50E-01 | 6.70E-03 | 1.60E-02 |
| n-Butylbenzene | 4 / 5 | 80 | 1.20E-03 | 1.00E-01 | 6.70E-03 | 1.60E-02 |
| n-Propylbenzene | 3 / 5 | 60 | 2.10E-03 | 1.10E-01 | 6.70E-03 | 1.60E-02 |
| p-Cymene | 4 / 5 | 80 | 1.20E-03 | 8.80E-02 | 6.70E-03 | 1.60E-02 |
| sec-Butylbenzene | 3 / 5 | 60 | 3.80E-03 | 4.40E-02 | 6.70E-03 | 1.60E-02 |
| tert-Butylbenzene | 2 / 5 | 40 | 2.30E-03 | 2.90E-02 | 6.70E-03 | 1.60E-02 |
| Toluene | 1 / 17 | 6 | 3.40E-03 | 3.40E-03 | 6.70E-03 | 1.00E-01 |
| Trichlorofluoromethane | 2 / 17 | 12 | 2.00E-03 | 2.30E-03 | 1.30E-02 | 2.30E-01 |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/kg = milligrams per kilogram
[a] Total soil is a combination of surface and subsurface soil.

## Table C3-23

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcel 80, Fort McClellan, Alabama

| Medium | Resident | | Recreational Site User | |
|---|---|---|---|---|
| | HI | ILCR | HI | ILCR |
| Surface Soil | 2.83E+01 | NA | 3.37E-01 | NA |
| Surface Water | NA | NA | NA | NA |
| Sediment | NA | NA | NA | NA |
| Groundwater | 1.01E+00 | 7.24E-04 | NA | NA |
| **Total HI / ILCR** | 2.93E+01 | 7.24E-04 | 3.37E-01 | NA |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C4-1

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcels 81 and 175, Fort McClellan, Alabama



| Sample Location | Sample Number | Sample Date | Chemical Analysis Performed |
|---|---|---|---|
| LF4-MW1 | MW1-1097 | 2-Oct-1997 | Metals, VOCs |
| LF4-MW1 | MW1-394 | 30-Mar-1994 | Metals, VOCs |
| LF4-MW1 | MW1-395 | 14-Mar-1995 | Metals, VOCs |
| LF4-MW1 | MW1-396 | 26-Mar-1996 | Metals, VOCs |
| LF4-MW1 | MW1-397 | 27-Mar-1997 | Metals, VOCs |
| LF4-MW1 | MW1-398 | 23-Mar-1998 | Metals, VOCs |
| LF4-MW1 | MW1-494 | 27-Apr-1994 | Metals, VOCs |
| LF4-MW1 | MW1-594 | 24-May-1994 | Metals, VOCs |
| LF4-MW1 | MW1-694 | 30-Jun-1994 | Metals, VOCs |
| LF4-MW1 | MW1-994 | 12-Sep-1994 | Metals, VOCs |
| LF4-MW1 | MW1-995 | 28-Sep-1995 | Metals, VOCs |
| LF4-MW1 | MW1-996 | 10-Sep-1996 | Metals, VOCs |
| LF4-MW1 | MW1-998 | 28-Sep-1998 | Metals, VOCs |
| LF4-MW2 | MW2-1097 | 2-Oct-1997 | Metals, VOCs |
| LF4-MW2 | MW2-394 | 30-Mar-1994 | Metals, VOCs |
| LF4-MW2 | MW2-395 | 14-Mar-1995 | Metals, VOCs |
| LF4-MW2 | MW2-396 | 26-Mar-1996 | Metals, VOCs |
| LF4-MW2 | MW2-397 | 27-Mar-1997 | Metals, VOCs |
| LF4-MW2 | MW2-398 | 23-Mar-1998 | Metals, VOCs |
| LF4-MW2 | MW2-494 | 27-Apr-1994 | Metals, VOCs |
| LF4-MW2 | MW2-594 | 24-May-1994 | Metals, VOCs |
| LF4-MW2 | MW2-694 | 30-Jun-1994 | Metals, VOCs |
| LF4-MW2 | MW2-994 | 12-Sep-1994 | Metals, VOCs |
| LF4-MW2 | MW2-995 | 28-Sep-1995 | Metals, VOCs |
| LF4-MW2 | MW2-996 | 10-Sep-1996 | Metals, VOCs |
| LF4-MW2 | MW2-998 | 28-Sep-1998 | Metals, VOCs |
| LF4-MW3 | MW3-1097 | 2-Oct-1997 | Metals, VOCs |
| LF4-MW3 | MW3-394 | 30-Mar-1994 | Metals, VOCs |
| LF4-MW3 | MW3-395 | 14-Mar-1995 | Metals, VOCs |
| LF4-MW3 | MW3-396 | 26-Mar-1996 | Metals, VOCs |
| LF4-MW3 | MW3-397 | 27-Mar-1997 | Metals, VOCs |
| LF4-MW3 | MW3-398 | 23-Mar-1998 | Metals, VOCs |
| LF4-MW3 | MW3-494 | 27-Apr-1994 | Metals, VOCs |
| LF4-MW3 | MW3-594 | 24-May-1994 | Metals, VOCs |
| LF4-MW3 | MW3-694 | 30-Jun-1994 | Metals, VOCs |
| LF4-MW3 | MW3-994 | 12-Sep-1994 | Metals, VOCs |
| LF4-MW3 | MW3-995 | 28-Sep-1995 | Metals, VOCs |
| LF4-MW3 | MW3-996 | 10-Sep-1996 | Metals, VOCs |
| LF4-MW3 | MW3-998 | 28-Sep-1998 | Metals, VOCs |
| LF4-MW4 | MW4-1097 | 2-Oct-1997 | Metals, VOCs |
| LF4-MW4 | MW4-394 | 30-Mar-1994 | Metals, VOCs |
| LF4-MW4 | MW4-395 | 14-Mar-1995 | Metals, VOCs |
| LF4-MW4 | MW4-396 | 26-Mar-1996 | Metals, VOCs |
| LF4-MW4 | MW4-397 | 27-Mar-1997 | Metals, VOCs |
| LF4-MW4 | MW4-398 | 23-Mar-1998 | Metals, VOCs |
| LF4-MW4 | MW4-494 | 27-Apr-1994 | Metals, VOCs |
| LF4-MW4 | MW4-594 | 24-May-1994 | Metals, VOCs |
| LF4-MW4 | MW4-694 | 30-Jun-1994 | Metals, VOCs |
| LF4-MW4 | MW4-994 | 12-Sep-1994 | Metals, VOCs |
| LF4-MW4 | MW4-995 | 28-Sep-1995 | Metals, VOCs |
| LF4-MW4 | MW4-996 | 10-Sep-1996 | Metals, VOCs |
| LF4-MW4 | MW4-998 | 28-Sep-1998 | Metals, VOCs |
| LF4-MW5 | MW5-1097 | 2-Oct-1997 | Metals, VOCs |
| LF4-MW5 | MW5-394 | 30-Mar-1994 | Metals, VOCs |
| LF4-MW5 | MW5-395 | 14-Mar-1995 | Metals, VOCs |
| LF4-MW5 | MW5-396 | 26-Mar-1996 | Metals, VOCs |
| LF4-MW5 | MW5-397 | 27-Mar-1997 | Metals, VOCs |

## Table C4-1

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcels 81 and 175, Fort McClellan, Alabama



| Sample Location | Sample Number | Sample Date | Chemical Analysis Performed |
|---|---|---|---|
| LF4-MW5 | MW5-398 | 23-Mar-1998 | Metals, VOCs |
| LF4-MW5 | MW5-494 | 27-Apr-1994 | Metals, VOCs |
| LF4-MW5 | MW5-594 | 24-May-1994 | Metals, VOCs |
| LF4-MW5 | MW5-694 | 30-Jun-1994 | Metals, VOCs |
| LF4-MW5 | MW5-994 | 12-Sep-1994 | Metals, VOCs |
| LF4-MW5 | MW5-995 | 28-Sep-1995 | Metals, VOCs |
| LF4-MW5 | MW5-995FD* | 28-Sep-1995 | Metals, VOCs |
| LF4-MW5 | MW5-996 | 10-Sep-1996 | Metals, VOCs |
| LF4-MW5 | MW5-998 | 28-Sep-1998 | Metals, VOCs |

* - Results for sample numbers MW5-995 and MW5-995FD were averaged.

VOC - Volatile organic compounds

## Table C4-2

### Selection of Site-Related Chemicals for Groundwater
### Parcels 81 and 175, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Statistical Distribution | Arithmetic Mean (mg/L) | Standard Deviation | ln mean | ln std dev | H or t value | 95% UCL (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Nutrient? | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | | |
| Antimony | 1 / 5 | 20 | 1.30E-02 | 1.30E-02 | 3.00E-03 | 3.00E-03 | NP | 3.80E-03 | 5.14E-03 | -6.07E+00 | 9.66E-01 | | 1.41E-02 | 3.19E-03 | 8.00E-04 | | N (e) |
| Arsenic | 16 / 65 | 25 | 1.30E-05 | 4.40E-02 | 1.00E-03 | 2.00E-02 | L | 6.79E-03 | 8.72E-03 | -5.59E+00 | 1.20E+00 | 2.47E+00 | 1.16E-02 | 1.78E-02 | 2.22E-01 | | N (b) |
| Barium | 38 / 65 | 58 | 5.00E-02 | 1.73E+00 | 1.00E-02 | 1.00E-01 | L | 2.29E-01 | 3.33E-01 | -2.52E+00 | 1.62E+00 | 2.95E+00 | 4.13E-01 | 1.27E-01 | 4.72E-01 | | Y |
| Beryllium | 1 / 5 | 20 | 3.00E-03 | 3.00E-03 | 1.00E-03 | 1.00E-03 | NP | 1.00E-03 | 1.12E-03 | -7.24E+00 | 8.01E-01 | | 3.24E-03 | 1.25E-03 | 2.37E-03 | | Y |
| Cadmium | 25 / 65 | 38 | 1.60E-04 | 7.60E-02 | 1.00E-04 | 1.00E-03 | L | 4.57E-03 | 1.34E-02 | -6.89E+00 | 1.40E+00 | 2.69E+00 | 1.20E-02 | 2.51E-03 | 5.03E-03 | | Y |
| Chromium | 13 / 65 | 20 | 1.55E-03 | 1.70E-01 | 1.00E-03 | 2.00E-02 | L | 1.27E-02 | 2.53E-02 | -5.22E+00 | 1.37E+00 | 2.65E+00 | 2.67E-02 | | | | Y |
| Iron | 63 / 65 | 97 | 9.00E-02 | 1.56E+02 | 2.00E-02 | 5.00E-02 | L | 1.88E+01 | 2.98E+01 | 1.57E+00 | 2.02E+00 | 3.44E+00 | 3.53E+01 | 7.04E+00 | 2.58E+01 | | Y |
| Lead | 37 / 65 | 57 | 2.50E-03 | 5.27E-01 | 1.00E-03 | 5.00E-03 | L | 4.60E-02 | 9.59E-02 | -4.69E+00 | 1.81E+00 | 3.17E+00 | 9.92E-02 | 8.00E-03 | 2.58E-02 | | Y |
| Manganese | 62 / 65 | 95 | 3.00E-02 | 5.28E+00 | 5.00E-03 | 5.00E-02 | L | 1.13E+00 | 1.25E+00 | -6.97E-01 | 1.60E+00 | 2.92E+00 | 1.83E+00 | 5.81E-01 | 4.13E+00 | | Y |
| Mercury | 3 / 65 | 5 | 7.00E-07 | 2.00E-03 | 2.00E-07 | 1.00E-03 | N | 3.92E-04 | 3.02E-04 | -9.05E+00 | 2.92E+00 | 1.67E+00 | 4.55E-04 | | | | N (c) |
| Selenium | 1 / 65 | 2 | 9.00E-03 | 9.00E-03 | 2.00E-03 | 2.00E-01 | L | 9.91E-03 | 2.62E-02 | -5.82E+00 | 1.09E+00 | 2.35E+00 | 2.45E-02 | | | | N (c) |
| Sodium | 65 / 65 | 100 | 1.92E-03 | 1.41E+02 | 1.00E-03 | 1.00E+00 | L | 1.91E+01 | 2.62E+01 | 1.79E+00 | 2.25E+00 | 3.74E+00 | 3.36E+01 | 1.48E+01 | 4.90E+01 | Y | N (d) |
| **Volatile Organic Compounds** | | | | | | | | | | | | | | | | | |
| Trichloroethene | 1 / 65 | 2 | 4.10E-02 | 4.10E-02 | 5.00E-03 | 5.00E-03 | L | 3.13E-03 | 4.78E-03 | -5.94E+00 | 3.56E-01 | 1.78E+00 | 5.78E-03 | | | | N (c) |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

mg/L = milligrams per liter

## Table C4-3

## Selection of Chemicals of Potential Concern for Groundwater
## Parcels 81 and 175, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident | | | | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| | | Noncancer | COPC? | Cancer | COPC? | | | |
| **Metals** | | | | | | | | |
| Barium | 1.73E+00 | 1.10E-01 | Y | NA | NA | L | 4.13E-01 | 4.13E-01 |
| Beryllium | 3.00E-03 | 3.13E-03 | N | NA | NA | | | |
| Cadmium | 7.60E-02 | 7.82E-04 | Y | NA | NA | L | 1.20E-02 | 1.20E-02 |
| Chromium | 1.70E-01 | 4.69E-03 | Y | NA | NA | L | 2.67E-02 | 2.67E-02 |
| Iron | 1.56E+02 | 4.69E-01 | Y | NA | NA | L | 3.53E+01 | 3.53E+01 |
| Lead | 5.27E-01 | 1.50E-02 | Y | NA | NA | L | 9.92E-02 | 9.92E-02 |
| Manganese | 5.28E+00 | 7.35E-02 | Y | NA | NA | L | 1.83E+00 | 1.83E+00 |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
mg/L = milligrams per liter
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C4-4

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Groundwater Parcels 81 and 175, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Barium | 4.13E-01 | 3.78E-01 | NA |
| Cadmium | 1.20E-02 | 1.53E+00 | NA |
| Chromium | 2.67E-02 | 5.69E-01 | NA |
| Iron | 3.53E+01 | 7.53E+00 | NA |
| Lead | 9.92E-02 | 6.61E-01 | NA |
| Manganese | 1.83E+00 | 2.48E+00 | NA |
| **Total HI / ILCR** | | **1.32E+01** | **NA** |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/L = milligrams per liter

## Table C4-5

## Separation of Noncancer Hazard by Target Organ for the Resident Parcels 81 and 175, Fort McClellan, Alabama

| COPC | Target Organ Hazard* | | | | | |
|---|---|---|---|---|---|---|
| | Cardio | CNS | Skin | PVS | ND | Kidney |
| ***For Groundwater:*** | | | | | | |
| Barium | 3.78E-01 | | | | | |
| Cadmium | | | | | | 1.53E+00 |
| Chromium | | | | | 5.69E-01 | |
| Manganese | | 2.48E+00 | | | | |
| **Resident HI by Target Organ:** | 3.78E-01 | 2.48E+00 | NA | NA | 5.69E-01 | 1.53E+00 |

COPC = Chemical of potential concern
CNS = Central nervous system
ND = No data
PVS = Peripheral vascular system
* See Toxicological Profiles for data regarding selection of target organs.

## Table C4-6

## Remedial Goal Options Based on Noncancer for Resident Groundwater
## Parcels 81 and 175, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/L) | MCL[a] (mg/L) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/L) Based on an HI of: 0.1 | 1 | 3 |
|---|---|---|---|---|---|---|
| **Metals** | | | | | | |
| Cadmium | 1.20E-02 | 0.005 | 1.53E+00 | 7.82E-04 | 7.82E-03 | 2.35E-02 |
| Manganese | 1.83E+00 | ND | 2.48E+00 | 7.35E-02 | 7.35E-01 | 2.21E+00 |

COC = Chemical of concern.
HI = Hazard index
MCL = Maximum contaminant level.
a = US Environmental Protection Agency, *National Primary Drinking Water Regulations*, March 2001, online.
ND = No data
mg/L = milligrams per liter

## Table C5-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 230, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-230-DEP01 | KCC0017 | 10-Mar-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, SVOC, VOC |
| PPMP-230-DEP02 | KCC0018 | 10-Mar-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, SVOC, VOC |
| PPMP-230-DEP03 | KCC0019 | 10-Mar-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, SVOC, VOC |
| PPMP-230-GP01 | KCC0001 | 9-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-230-GP01 | KCC0001R | 14-Apr-1999 | 0 - 1 | OP Pest |
| PPMP-230-GP02 | KCC0005 | 9-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-230-GP02 | KCC0005R | 14-Apr-1999 | 0 - 1 | OP Pest |
| PPMP-230-GP03 | KCC0007 | 9-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-230-GP03 | KCC0007R | 14-Apr-1999 | 0 - 1 | OP Pest |
| PPMP-230-GP04 | KCC0009 | 24-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, SVOC, VOC |
| PPMP-230-GP05 | KCC0011 | 24-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, SVOC, VOC |
| PPMP-230-GP06 | KCC0013 | 24-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, SVOC, VOC |
| PPMP-230-GP07 | KCC0015 | 9-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-230-GP07 | KCC0015R | 14-Apr-1999 | 0 - 1 | OP Pest |

CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
Nitro - Nitroaromatics
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
ft - feet

## Table C5-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 230, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 10 / 10 | 100 | 3.45E+03 | 8.98E+03 | 2.19E+01 | 2.99E+01 | 4.78E+03 | 1.63E+04 | 2.14E+04 | N (a) |
| Arsenic | 10 / 10 | 100 | 1.30E+00 | 5.80E+00 | 1.10E+00 | 1.50E+00 | 3.00E+00 | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 10 / 10 | 100 | 2.56E+01 | 8.04E+01 | 2.19E+01 | 2.99E+01 | 3.99E+01 | 1.24E+02 | 1.94E+02 | N (a) |
| Beryllium | 10 / 10 | 100 | 2.60E-01 | 7.60E-01 | 5.50E-01 | 7.50E-01 | 4.26E-01 | 8.00E-01 | 8.68E-01 | N (a) |
| Calcium | 10 / 10 | 100 | 1.57E+02 | 3.26E+03 | 5.48E+02 | 7.47E+02 | 1.15E+03 | 1.72E+03 | 3.54E+03 | N (d) |
| Chromium | 10 / 10 | 100 | 5.70E+00 | 1.40E+01 | 1.10E+00 | 1.50E+00 | 8.11E+00 | 3.70E+01 | 6.44E+01 | N (a) |
| Cobalt | 10 / 10 | 100 | 1.20E+00 | 4.10E+00 | 5.50E+00 | 7.50E+00 | 2.20E+00 | 1.52E+01 | 3.25E+01 | N (a) |
| Copper | 10 / 10 | 100 | 1.70E+00 | 1.36E+01 | 2.70E+00 | 3.70E+00 | 5.34E+00 | 1.27E+01 | 2.25E+01 | N (b) |
| Iron | 10 / 10 | 100 | 3.82E+03 | 1.55E+04 | 1.10E+01 | 1.49E+01 | 9.64E+03 | 3.42E+04 | 5.54E+04 | N (a) |
| Lead | 10 / 10 | 100 | 9.00E+00 | 7.95E+01 | 3.30E-01 | 4.50E-01 | 2.30E+01 | 4.01E+01 | 6.38E+01 | Y |
| Magnesium | 10 / 10 | 100 | 1.62E+02 | 5.05E+02 | 5.48E+02 | 7.47E+02 | 2.64E+02 | 1.03E+03 | 9.60E+03 | N (a) |
| Manganese | 10 / 10 | 100 | 1.70E+01 | 3.11E+02 | 1.60E+00 | 2.20E+00 | 1.43E+02 | 1.58E+03 | 4.66E+03 | N (a) |
| Mercury | 10 / 10 | 100 | 3.10E-02 | 1.50E+00 | 3.60E-02 | 4.90E-02 | 1.97E-01 | 8.00E-02 | 3.22E-01 | Y |
| Nickel | 10 / 10 | 100 | 1.90E+00 | 6.60E+00 | 4.40E+00 | 6.00E+00 | 3.20E+00 | 1.03E+01 | 2.00E+01 | N (a) |
| Potassium | 10 / 10 | 100 | 1.22E+02 | 2.53E+02 | 5.48E+02 | 7.47E+02 | 1.84E+02 | 8.00E+02 | 6.01E+03 | N (a) |
| Selenium | 10 / 10 | 100 | 4.40E-01 | 1.10E+00 | 5.50E-01 | 7.50E-01 | 6.88E-01 | 4.80E-01 | 1.28E+00 | N (b) |
| Vanadium | 10 / 10 | 100 | 8.30E+00 | 2.71E+01 | 5.50E+00 | 7.50E+00 | 1.32E+01 | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 10 / 10 | 100 | 6.70E+00 | 6.70E+01 | 2.20E+00 | 3.00E+00 | 1.94E+01 | 4.06E+01 | 7.37E+01 | N (b) |
| **Chlorinated Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 1 / 10 | 10 | 6.20E-03 | 6.20E-03 | 5.60E-03 | 9.90E-03 | 3.47E-03 | | | Y |
| 4,4'-DDT | 2 / 10 | 20 | 3.50E-03 | 5.10E-03 | 5.60E-03 | 9.90E-03 | 3.42E-03 | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Benzo(a)pyrene | 1 / 10 | 10 | 6.50E-02 | 6.50E-02 | 3.60E-01 | 4.90E-01 | 1.91E-01 | | | Y |
| Benzo(b)fluoranthene | 1 / 10 | 10 | 5.40E-02 | 5.40E-02 | 3.60E-01 | 4.90E-01 | 1.90E-01 | | | Y |
| Benzo(ghi)perylene | 1 / 10 | 10 | 6.90E-02 | 6.90E-02 | 3.60E-01 | 4.90E-01 | 1.91E-01 | | | Y |
| Chrysene | 1 / 10 | 10 | 6.00E-02 | 6.00E-02 | 3.60E-01 | 4.90E-01 | 1.91E-01 | | | Y |
| Fluoranthene | 1 / 10 | 10 | 9.30E-02 | 9.30E-02 | 3.60E-01 | 4.90E-01 | 1.94E-01 | | | Y |
| Pyrene | 1 / 10 | 10 | 7.10E-02 | 7.10E-02 | 3.60E-01 | 4.90E-01 | 1.92E-01 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 1 / 10 | 10 | 7.00E-03 | 7.00E-03 | 5.50E-03 | 7.50E-03 | 3.52E-03 | | | Y |
| 1,2-Dimethylbenzene | 2 / 10 | 20 | 7.30E-03 | 3.30E-02 | 5.50E-03 | 7.50E-03 | 6.57E-03 | | | Y |
| Acetone | 2 / 2 | 100 | 1.60E-02 | 1.80E-02 | 2.60E-02 | 2.70E-02 | 1.70E-02 | | | Y |
| Ethylbenzene | 3 / 10 | 30 | 2.30E-03 | 3.50E-02 | 5.50E-03 | 7.50E-03 | 6.73E-03 | | | Y |
| m,p-Xylenes | 3 / 10 | 30 | 7.40E-03 | 1.10E-01 | 5.50E-03 | 7.50E-03 | 1.64E-02 | | | Y |
| Naphthalene | 1 / 10 | 10 | 3.90E-03 | 3.90E-03 | 5.50E-03 | 7.50E-03 | 3.21E-03 | | | Y |
| n-Butylbenzene | 1 / 10 | 10 | 3.70E-03 | 3.70E-03 | 5.50E-03 | 7.50E-03 | 3.19E-03 | | | Y |
| p-Cymene | 3 / 10 | 30 | 4.80E-03 | 5.10E-03 | 5.50E-03 | 7.50E-03 | 3.59E-03 | | | Y |
| Toluene | 2 / 10 | 20 | 2.30E-03 | 1.70E-02 | 5.50E-03 | 7.50E-03 | 4.47E-03 | | | Y |
| Trichlorofluoromethane | 2 / 10 | 20 | 3.10E-03 | 4.10E-03 | 1.10E-02 | 1.50E-02 | 5.77E-03 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

mg/kg = milligrams per kilogram

[a] Surface soil is defined by samples taken from 0 to 1 feet below ground surface.

[b] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C5-3

## Selection of Chemicals of Potential Concern for Surface Soil[a]
## Parcel 230, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Lead | 7.95E+01 | 4.00E+02 | N | NA | NA | 4.00E+02 | N | NA | NA |
| Mercury | 1.50E+00 | 2.33E+00 | N | NA | NA | 1.84E+02 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDE | 6.20E-03 | NA | NA | 1.79E+00 | N | NA | NA | 1.22E+02 | N |
| 4,4'-DDT | 5.10E-03 | 3.83E+00 | N | 1.79E+00 | N | 2.95E+02 | N | 1.22E+02 | N |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Benzo(a)pyrene | 6.50E-02 | NA | NA | 8.51E-02 | N | NA | NA | 5.81E+00 | N |
| Benzo(b)fluoranthene | 5.40E-02 | NA | NA | 8.51E-01 | N | NA | NA | 5.81E+01 | N |
| Benzo(ghi)perylene | 6.90E-02 | 2.32E+02 | N | NA | NA | 1.82E+04 | N | NA | NA |
| Chrysene | 6.00E-02 | NA | NA | 8.61E+01 | N | NA | NA | 5.90E+03 | N |
| Fluoranthene | 9.30E-02 | 3.09E+02 | N | NA | NA | 2.43E+04 | N | NA | NA |
| Pyrene | 7.10E-02 | 2.33E+02 | N | NA | NA | 1.85E+04 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 7.00E-03 | 3.88E+02 | N | NA | NA | 3.08E+04 | N | NA | NA |
| 1,2-Dimethylbenzene | 3.30E-02 | 1.55E+04 | N | NA | NA | 1.24E+06 | N | NA | NA |
| Acetone | 1.80E-02 | 7.76E+02 | N | NA | NA | 6.16E+04 | N | NA | NA |
| Ethylbenzene | 3.50E-02 | 7.77E+02 | N | NA | NA | 6.18E+04 | N | NA | NA |
| m,p-Xylenes | 1.10E-01 | 1.55E+04 | N | NA | NA | 1.24E+06 | N | NA | NA |
| Naphthalene | 3.90E-03 | 1.55E+02 | N | NA | NA | 1.24E+04 | N | NA | NA |
| n-Butylbenzene | 3.70E-03 | 7.77E+01 | N | NA | NA | 6.17E+03 | N | NA | NA |
| p-Cymene | 5.10E-03 | 1.55E+03 | N | NA | NA | 1.23E+05 | N | NA | NA |
| Toluene | 1.70E-02 | 1.55E+03 | N | NA | NA | 1.24E+05 | N | NA | NA |
| Trichlorofluoromethane | 4.10E-03 | 2.33E+03 | N | NA | NA | 1.85E+05 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
mg/kg = milligrams per kilogram
NA = not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined by samples taken from 0 to 1 feet below ground surface.

## Table C5-4

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 230, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-230-SEP01 | KCC2004 | 11-Feb-1999 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-230-SEP02 | KCC2005 | 11-Feb-1999 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-230-SEP03 | KCC2006 | 11-Feb-1999 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-230-SW/SD01 | KCC2001 | 29-Jan-1999 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-230-SW/SD02 | KCC2002 | 29-Jan-1999 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-230-SW/SD02 | KCC2003 | 29-Jan-1999 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |

CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
Nitro - Nitroaromatics
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds

## Table C5-5

## Selection of Site-Related Chemicals for Surface Water
## Parcel 230, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 5 / 5 | 100 | 1.69E-01 | 1.35E+00 | 2.00E-01 | 2.00E-01 | 5.31E-01 | 5.26E+00 | 1.70E+01 | N (a) |
| Barium | 6 / 6 | 100 | 1.53E-02 | 6.38E-02 | 2.00E-01 | 2.00E-01 | 3.35E-02 | 7.54E-02 | 1.13E-01 | N (a) |
| Calcium | 6 / 6 | 100 | 1.64E+00 | 1.09E+02 | 5.00E+00 | 5.00E+00 | 2.49E+01 | 2.52E+01 | 6.41E+01 | N (d) |
| Iron | 6 / 6 | 100 | 5.83E-02 | 2.46E+00 | 1.00E-01 | 1.00E-01 | 8.38E-01 | 1.96E+01 | 4.12E+01 | N (a) |
| Magnesium | 6 / 6 | 100 | 9.63E-01 | 7.86E+00 | 5.00E+00 | 5.00E+00 | 3.80E+00 | 1.10E+01 | 2.44E+01 | N (a) |
| Manganese | 6 / 6 | 100 | 5.00E-03 | 8.45E-01 | 1.50E-02 | 1.50E-02 | 2.70E-01 | 5.65E-01 | 1.83E+00 | N (b) |
| Potassium | 3 / 6 | 50 | 1.74E+00 | 2.69E+00 | 5.00E+00 | 5.00E+00 | 2.34E+00 | 2.56E+00 | 4.25E+00 | N(d) |
| Zinc | 1 / 6 | 17 | 1.16E-02 | 1.16E-02 | 2.00E-02 | 2.00E-02 | 1.03E-02 | 4.04E-02 | 1.82E-01 | N (a) |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 1 / 6 | 17 | 1.30E-03 | 1.30E-03 | 1.00E-02 | 1.00E-02 | 4.38E-03 | | | Y |

mg/L = milligrams per liter

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C5-6

## Selection of Chemicals of Potential Concern for Surface Water
## Parcel 230, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 1.30E-03 | 2.07E-01 | N | 5.17E-02 | N | 2.07E-01 | N | 5.17E-02 | N |

mg/L = milligrams per liter
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C5-7

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 230, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-230-SW/SD01 | KCC1001 | 29-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, SVOCs, VOCs, OP Pest, Nitro, PCBs |
| PPMP-230-SW/SD02 | KCC1003 | 29-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, SVOCs, VOCs, OP Pest, Nitro, PCBs |
| PPMP-230-SW/SD03 | KCC1004 | 29-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, SVOCs, VOCs, OP Pest, Nitro, PCBs |

CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
Nitro - Nitroaromatics
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinated biphenyls
SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
ft - feet

## Table C5-8

## Selection of Site-Related Chemicals for Sediment
## Parcel 230, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion [a] (mg/kg) | 95% UTL[b] (mg/kg) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 1.35E+03 | 2.25E+03 | 2.55E+01 | 2.70E+01 | 1.66E+03 | 8.59E+03 | 1.43E+04 | N (a) |
| Arsenic | 3 / 3 | 100 | 7.20E-01 | 1.60E+00 | 1.30E+00 | 1.40E+00 | 1.04E+00 | 1.13E+01 | 2.01E+01 | N (a) |
| Barium | 3 / 3 | 100 | 8.70E+00 | 1.86E+01 | 2.55E+01 | 2.70E+01 | 1.20E+01 | 9.89E+01 | 1.91E+02 | N (a) |
| Beryllium | 3 / 3 | 100 | 1.60E-01 | 3.80E-01 | 6.40E-01 | 6.80E-01 | 2.90E-01 | 9.70E-01 | 1.24E+00 | N (a) |
| Calcium | 3 / 3 | 100 | 1.71E+02 | 3.65E+02 | 6.38E+02 | 6.76E+02 | 2.38E+02 | 1.11E+03 | 2.81E+03 | N (a) |
| Chromium | 3 / 3 | 100 | 2.90E+00 | 3.50E+00 | 1.30E+00 | 1.40E+00 | 3.23E+00 | 3.12E+01 | 6.33E+01 | N (a) |
| Cobalt | 3 / 3 | 100 | 6.90E-01 | 1.00E+00 | 6.40E+00 | 6.80E+00 | 8.13E-01 | 1.10E+01 | 2.19E+01 | N (a) |
| Copper | 3 / 3 | 100 | 1.40E+00 | 3.70E+00 | 3.20E+00 | 3.40E+00 | 2.40E+00 | 1.71E+01 | 3.68E+01 | N (a) |
| Iron | 3 / 3 | 100 | 2.56E+03 | 5.76E+03 | 1.28E+01 | 1.35E+01 | 4.01E+03 | 3.53E+04 | 5.19E+04 | N (a) |
| Lead | 3 / 3 | 100 | 3.80E+00 | 1.05E+01 | 3.80E-01 | 4.10E-01 | 6.17E+00 | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 3 / 3 | 100 | 1.08E+02 | 1.51E+02 | 6.38E+02 | 6.76E+02 | 1.24E+02 | 9.06E+02 | 2.20E+03 | N (a) |
| Manganese | 3 / 3 | 100 | 2.92E+01 | 6.29E+01 | 1.90E+00 | 2.00E+00 | 4.07E+01 | 7.12E+02 | 2.05E+03 | N (a) |
| Mercury | 3 / 3 | 100 | 1.80E-02 | 2.30E-01 | 4.20E-02 | 4.50E-02 | 9.07E-02 | 1.10E-01 | 1.75E-01 | Y |
| Potassium | 1 / 2 | 50 | 1.15E+02 | 1.15E+02 | 6.61E+02 | 6.76E+02 | 2.27E+02 | 1.01E+03 | 2.79E+03 | N (a) |
| Vanadium | 3 / 3 | 100 | 5.20E+00 | 9.10E+00 | 6.40E+00 | 6.80E+00 | 6.57E+00 | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 3 / 3 | 100 | 4.80E+00 | 7.10E+00 | 2.60E+00 | 2.70E+00 | 5.93E+00 | 5.27E+01 | 1.11E+02 | N (a) |
| **Chlorinated Pesticides** | | | | | | | | | | |
| 4,4'-DDT | 1 / 3 | 33 | 1.40E-03 | 1.40E-03 | 6.50E-03 | 6.90E-03 | 2.67E-03 | | | Y |
| Endosulfan sulfate | 1 / 3 | 33 | 1.10E-03 | 1.10E-03 | 6.50E-03 | 6.90E-03 | 2.57E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 2-Butanone | 1 / 1 | 100 | 3.90E-03 | 3.90E-03 | 2.70E-02 | 2.70E-02 | 3.90E-03 | | | Y |
| Acetone | 2 / 2 | 100 | 7.20E-03 | 1.90E-02 | 2.60E-02 | 2.70E-02 | 1.31E-02 | | | Y |

mg/kg = milligrams per kilogram

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C5-9

## Selection of Chemicals of Potential Concern for Sediment
## Parcel 230, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Mercury | 2.30E-01 | 2.99E+02 | N | NA | NA | 2.99E+02 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDT | 1.40E-03 | 4.03E+02 | N | 1.66E+02 | N | 4.03E+02 | N | 1.66E+02 | N |
| Endosulfan sulfate | 1.10E-03 | 6.12E+03 | N | NA | NA | 6.12E+03 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| 2-Butanone | 3.90E-03 | 6.23E+05 | N | NA | NA | 6.23E+05 | N | NA | NA |
| Acetone | 1.90E-02 | 1.03E+05 | N | NA | NA | 1.03E+05 | N | NA | NA |

mg/kg = milligrams per kilogram

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).

COPC = Chemical of potential concern.

N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

NA = Not applicable

## Table C5-10

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 230, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-230-GP01 | KCC3001 | 1-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-230-GP02 | KCC3004 | 1-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-230-GP03 | KCC3005 | 2-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C5-11

## Selection of Site-Related Chemicals for Groundwater
## Parcel 230, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 9.15E-01 | 3.27E+00 | 2.00E-01 | 2.00E-01 | 2.44E+00 | 2.34E+00 | 9.60E+00 | N (b) |
| Arsenic | 1 / 3 | 33 | 4.20E-03 | 4.20E-03 | 1.00E-02 | 1.00E-02 | 4.73E-03 | 1.78E-02 | 2.22E-01 | N (a) |
| Barium | 3 / 3 | 100 | 7.82E-02 | 1.35E-01 | 2.00E-01 | 2.00E-01 | 1.02E-01 | 1.27E-01 | 4.72E-01 | N (b) |
| Calcium | 3 / 3 | 100 | 1.53E+01 | 1.17E+02 | 5.00E+00 | 5.00E+00 | 6.33E+01 | 5.65E+01 | 4.52E+02 | N (b) |
| Cobalt | 2 / 3 | 67 | 6.50E-03 | 8.00E-03 | 5.00E-02 | 5.00E-02 | 1.32E-02 | 2.34E-02 | 2.52E-02 | N (a) |
| Iron | 3 / 3 | 100 | 4.08E+00 | 1.63E+01 | 1.00E-01 | 1.00E-01 | 1.17E+01 | 7.04E+00 | 2.58E+01 | N (b) |
| Lead | 2 / 3 | 67 | 2.80E-03 | 8.50E-03 | 3.00E-03 | 3.00E-03 | 4.27E-03 | 8.00E-03 | 2.58E-02 | N (b) |
| Magnesium | 3 / 3 | 100 | 8.06E+00 | 1.55E+01 | 5.00E+00 | 5.00E+00 | 1.23E+01 | 2.13E+01 | 1.49E+02 | N (a) |
| Manganese | 3 / 3 | 100 | 1.21E+00 | 2.91E+00 | 1.50E-02 | 1.50E-02 | 2.19E+00 | 5.81E-01 | 4.13E+00 | N (b) |
| Potassium | 2 / 2 | 100 | 1.74E+00 | 1.05E+01 | 5.00E+00 | 5.00E+00 | 6.12E+00 | 7.20E+00 | 6.85E+01 | N (b) |
| Sodium | 2 / 2 | 100 | 8.03E+00 | 9.64E+00 | 5.00E+00 | 5.00E+00 | 8.84E+00 | 1.48E+01 | 4.90E+01 | N (a) |
| Vanadium | 1 / 3 | 33 | 7.60E-03 | 7.60E-03 | 5.00E-02 | 5.00E-02 | 1.92E-02 | 1.70E-02 | 1.14E-02 | N (a) |
| **Semivolatile Organics** | | | | | | | | | | |
| 4-Methylphenol | 1 / 3 | 33 | 4.40E-03 | 4.40E-03 | 1.00E-02 | 1.00E-02 | 4.80E-03 | | | Y |
| **Volatile Organics** | | | | | | | | | | |
| 2-Butanone | 1 / 1 | 100 | 8.30E-03 | 8.30E-03 | 5.00E-03 | 5.00E-03 | 8.30E-03 | | | Y |
| Acetone | 1 / 1 | 100 | 1.70E-02 | 1.70E-02 | 1.00E-02 | 1.00E-02 | 1.70E-02 | | | Y |
| p-Cymene | 2 / 2 | 100 | 7.30E-04 | 8.20E-03 | 1.00E-03 | 1.00E-03 | 4.47E-03 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.

## Table C5-12

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 230, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | |
|---|---|---|---|---|---|
| | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? |
| **Semivolatile Organics** | | | | | |
| 4-Methylphenol | 4.40E-03 | 7.69E-03 | N | NA | NA |
| **Volatile Organics** | | | | | |
| 2-Butanone | 8.30E-03 | 7.14E-01 | N | NA | NA |
| Acetone | 1.70E-02 | 1.56E-01 | N | NA | NA |
| p-Cymene | 8.20E-03 | 2.26E-01 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
NA = Not applicable.

## Table C6-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcels 126 and 227, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| FTA-126-DEP01 | EF0009 | 12-Nov-98 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-DEP02 | EF0010 | 12-Nov-98 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-DEP03 | EF0011 | 12-Nov-98 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, PCBs |
| FTA-126-DEP03 | EF0011R | 23-Nov-98 | 0 - 0.5 | VOCs |
| FTA-126-GP01 | EF0001 | 23-Feb-99 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-GP02 | EF0003 | 23-Feb-99 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-GP03 | EF0007 | 22-Feb-99 | 0 - 1.5 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-DEP01 | KB0019 | 10-Mar-99 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-DEP02 | KB0020 | 11-Mar-1999 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-DEP03 | KB0023 | 10-Mar-1999 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP14 | KB0016 | 26-Mar-1999 | 0.5 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP15 | KB0017 | 26-Mar-1999 | 0.5 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP16 | KB0018 | 26-Mar-1999 | 0.5 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
PCBs - Polychlorinated biphenyls
OP Pest - Organophosphate Pesticides

## Table C6-2

### Selection of Site-Related Chemicals forSurface Soil[a]
### Parcels 126 and 227, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 12 / 12 | 100 | 2.79E+03 | 1.08E+04 | 2.30E+01 | 3.19E+01 | 5.74E+03 | 1.63E+04 | 2.14E+04 | N (a) |
| Arsenic | 12 / 12 | 100 | 2.50E+00 | 6.10E+00 | 1.20E+00 | 1.60E+00 | 4.43E+00 | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 12 / 12 | 100 | 2.99E+01 | 1.48E+02 | 2.30E+01 | 3.19E+01 | 7.07E+01 | 1.24E+02 | 1.94E+02 | N (b) |
| Beryllium | 10 / 12 | 83 | 3.10E-01 | 8.60E-01 | 5.80E-01 | 8.00E-01 | 5.68E-01 | 8.00E-01 | 8.68E-01 | N (b) |
| Calcium | 12 / 12 | 100 | 3.02E+02 | 4.01E+03 | 5.75E+02 | 7.97E+02 | 1.55E+03 | 1.72E+03 | 3.54E+03 | N (d) |
| Chromium | 12 / 12 | 100 | 6.90E+00 | 4.79E+01 | 1.20E+00 | 1.60E+00 | 1.35E+01 | 3.70E+01 | 6.44E+01 | N (b) |
| Cobalt | 11 / 12 | 92 | 2.80E+00 | 1.11E+01 | 5.80E+00 | 8.00E+00 | 6.04E+00 | 1.52E+01 | 3.25E+01 | N (a) |
| Copper | 12 / 12 | 100 | 4.00E+00 | 4.75E+01 | 2.90E+00 | 4.00E+00 | 1.13E+01 | 1.27E+01 | 2.25E+01 | Y |
| Iron | 12 / 12 | 100 | 8.06E+03 | 2.07E+04 | 1.15E+01 | 1.59E+01 | 1.35E+04 | 3.42E+04 | 5.54E+04 | N (a) |
| Lead | 12 / 12 | 100 | 1.11E+01 | 5.11E+01 | 3.50E-01 | 4.80E-01 | 2.67E+01 | 4.01E+01 | 6.38E+01 | N (b) |
| Magnesium | 9 / 12 | 75 | 1.94E+02 | 6.77E+02 | 5.75E+02 | 7.97E+02 | 3.61E+02 | 1.03E+03 | 9.60E+03 | N (a) |
| Manganese | 12 / 12 | 100 | 2.24E+02 | 1.82E+03 | 1.70E+00 | 2.40E+00 | 7.87E+02 | 1.58E+03 | 4.66E+03 | N (b) |
| Mercury | 7 / 8 | 88 | 6.30E-02 | 1.60E-01 | 3.90E-02 | 5.30E-02 | 8.02E-02 | 8.00E-02 | 3.22E-01 | N (b) |
| Nickel | 11 / 12 | 92 | 2.80E+00 | 7.00E+00 | 4.60E+00 | 6.40E+00 | 4.73E+00 | 1.03E+01 | 2.00E+01 | N (a) |
| Potassium | 8 / 11 | 73 | 1.31E+02 | 6.22E+02 | 5.75E+02 | 7.97E+02 | 3.46E+02 | 8.00E+02 | 6.01E+03 | N (a) |
| Selenium | 10 / 12 | 83 | 5.10E-01 | 1.20E+00 | 5.80E-01 | 8.00E-01 | 7.33E-01 | 4.80E-01 | 1.28E+00 | N (b) |
| Vanadium | 12 / 12 | 100 | 1.24E+01 | 3.16E+01 | 5.80E+00 | 8.00E+00 | 1.84E+01 | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 12 / 12 | 100 | 6.90E+00 | 9.36E+01 | 2.30E+00 | 3.20E+00 | 2.71E+01 | 4.06E+01 | 7.37E+01 | Y |
| **Chlorinated Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 1 / 12 | 8 | 1.20E-02 | 1.20E-02 | 5.90E-03 | 4.80E-02 | 7.44E-03 | | | Y |
| 4,4'-DDT | 1 / 12 | 8 | 9.40E-03 | 9.40E-03 | 5.90E-03 | 4.80E-02 | 7.23E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| Acetone | 6 / 6 | 100 | 1.70E-02 | 2.20E-01 | 2.40E-02 | 3.20E-02 | 9.78E-02 | | | Y |
| Cumene | 1 / 12 | 8 | 3.50E-03 | 3.50E-03 | 5.80E-03 | 8.00E-03 | 3.33E-03 | | | Y |
| p-Cymene | 1 / 12 | 8 | 6.40E-02 | 6.40E-02 | 5.80E-03 | 8.00E-03 | 8.33E-03 | | | Y |
| Toluene | 2 / 12 | 17 | 2.40E-03 | 3.00E-03 | 5.80E-03 | 8.00E-03 | 3.17E-03 | | | Y |
| Trichlorofluoromethane | 4 / 12 | 33 | 3.20E-03 | 5.40E-03 | 1.20E-02 | 1.60E-02 | 5.85E-03 | | | Y |
| 2-Butanone | 1 / 1 | 100 | 1.60E-02 | 1.60E-02 | 3.00E-02 | 3.00E-02 | 1.60E-02 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Surface soil is defined as 0 to 1.5 foot below ground surface.

[b] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

mg/kg = milligrams per kilogram

## Table C6-3

## Selection of Chemicals of Potential Concern for Surface Soil[a]
## Parcels 126 and 227, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Copper | 4.75E+01 | 2.52E+04 | N | NA | NA | 3.13E+02 | N | NA | NA |
| Zinc | 9.36E+01 | 1.88E+05 | N | NA | NA | 2.34E+03 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDE | 1.20E-02 | NA | NA | 1.22E+02 | N | NA | NA | 1.79E+00 | N |
| 4,4'-DDT | 9.40E-03 | 2.95E+02 | N | 1.22E+02 | N | 3.83E+00 | N | 1.79E+00 | N |
| **Volatile Organic Compounds** | | | | | | | | | |
| Acetone | 2.20E-01 | 6.16E+04 | N | NA | NA | 7.76E+02 | N | NA | NA |
| Cumene | 3.50E-03 | 6.17E+04 | N | NA | NA | 7.77E+02 | N | NA | NA |
| p-Cymene | 6.40E-02 | 1.23E+05 | N | NA | NA | 1.55E+03 | N | NA | NA |
| Toluene | 3.00E-03 | 1.24E+05 | N | NA | NA | 1.55E+03 | N | NA | NA |
| Trichlorofluoromethane | 5.40E-03 | 1.85E+05 | N | NA | NA | 2.33E+03 | N | NA | NA |
| 2-Butanone | 1.60E-02 | 3.70E+05 | N | NA | NA | 4.66E+03 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health and Ecological Screening Values & PAH Background Summary Report*, (IT, August 2000).
COPC = Chemical of potential concern
mg/kg = milligrams per kilogram
NA = not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as 0 to 1.5 foot below ground surface.

## Table C6-4

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcels 126 and 227, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| FTA-126-SW/SD01 | EF2001 | 21-Oct-1998 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-SW/SD02 | EF2004 | 21-Oct-1998 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-SW/SD03 | EF2005 | 21-Oct-1998 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD01 | KB2001 | 9-Feb-1999 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD01 | KB2001R | 1-Jul-1999 | Nitroaromatics |
| PPMP-227-SW/SD02 | KB2004 | 28-Jan-1999 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD02 | KB2004R | 30-Jun-1999 | Nitroaromatics |
| PPMP-227-SW/SD03 | KB2005 | 28-Jan-1999 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD03 | KB2005R | 30-Jun-1999 | Nitroaromatics |
| PPMP-227-SW/SD04 | KB2006 | 11-Feb-1999 | CL Herb, Cl Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD04 | KB2006R | 1-Jul-1999 | Nitroaromatics |
| PPMP-227-SW/SD05 | KB2007R | 1-Jul-1999 | Nitroaromatics |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
PCBs - Polychlorinated biphenyls
OP Pest - Organophosphate Pesticides

## Table C6-5

## Selection of Site-Related Chemicals for Surface Water
## Parcels 126 and 227, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 4 / 4 | 100 | 3.65E-01 | 1.54E+00 | 2.00E-01 | 2.00E-01 | 9.08E-01 | 5.26E+00 | 1.70E+01 | N (a) |
| Barium | 4 / 7 | 57 | 1.53E-02 | 2.10E-02 | 2.00E-01 | 2.00E-01 | 5.26E-02 | 7.54E-02 | 1.13E-01 | N (a) |
| Calcium | 7 / 7 | 100 | 1.09E+01 | 8.60E+01 | 5.00E+00 | 5.00E+00 | 3.31E+01 | 2.52E+01 | 6.41E+01 | N (d) |
| Iron | 6 / 6 | 100 | 8.06E-02 | 5.57E+01 | 1.00E-01 | 1.00E-01 | 1.27E+01 | 1.96E+01 | 4.12E+01 | N (e) |
| Magnesium | 7 / 7 | 100 | 5.65E+00 | 2.16E+01 | 5.00E+00 | 5.00E+00 | 1.33E+01 | 1.10E+01 | 2.44E+01 | N (b) |
| Manganese | 7 / 7 | 100 | 2.15E-02 | 1.11E+01 | 1.50E-02 | 1.50E-02 | 3.72E+00 | 5.65E-01 | 1.83E+00 | Y |
| Mercury | 4 / 7 | 57 | 5.30E-05 | 1.70E-04 | 2.00E-04 | 2.00E-04 | 9.19E-05 | | | Y |
| Potassium | 2 / 6 | 33 | 8.38E-01 | 9.19E-01 | 5.00E+00 | 5.00E+00 | 1.96E+00 | 2.56E+00 | 4.25E+00 | N (a) |
| Zinc | 1 / 7 | 14 | 3.46E-02 | 3.46E-02 | 2.00E-02 | 2.00E-02 | 1.35E-02 | 4.04E-02 | 1.82E-01 | N (a) |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 3 / 7 | 43 | 1.10E-03 | 2.30E-03 | 1.00E-02 | 1.00E-02 | 3.59E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| Acetone | 1 / 1 | 100 | 1.60E-03 | 1.60E-03 | 1.00E-02 | 1.00E-02 | 1.60E-03 | | | Y |
| Toluene | 1 / 7 | 14 | 2.20E-04 | 2.20E-04 | 1.00E-03 | 1.00E-03 | 4.60E-04 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

mg/L = milligrams per liter

## Table C6-6

## Selection of Chemicals of Potential Concern for Surface Water
## Parcels 126 and 227, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Manganese | 2.15E-02 | 6.40E-01 | N | NA | NA | 6.40E-01 | N | NA | NA |
| Mercury | 1.70E-04 | 4.25E-03 | N | NA | NA | 4.25E-03 | N | NA | NA |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 2.30E-03 | 2.07E-01 | N | 5.17E-02 | N | 2.07E-01 | N | 5.17E-02 | N |
| **Volatile Organic Compounds** | | | | | | | | | |
| Acetone | 1.60E-03 | 1.57E+00 | N | NA | NA | 1.57E+00 | N | NA | NA |
| Toluene | 2.20E-04 | 2.32E+00 | N | NA | NA | 2.32E+00 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health and Ecological Screening Values & PAH Background Summary Report,* (IT, August 2000).
COPC = Chemical of potential concern.
mg/L = milligrams per liter
NA = not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C6-7

## Sediment Samples Used in Streamlined Risk Assessment
## Parcels 126 and 227, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| FTA-126-SW/SD01 | EF1001 | 21-Oct-1998 | 0 - 0.5 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-SW/SD02 | EF1002 | 21-Oct-1998 | 0 - 0.5 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-SW/SD03 | EF1003 | 21-Oct-1998 | 0 - 0.5 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD01 | KB1001 | 9-Feb-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD01 | KB1001R | 13-Apr-1999 | 0 - 0.5 | OP Pest |
| PPMP-227-SW/SD01 | KB1001R1 | 1-Jul-1999 | 0 - 0 | Nitroaromatics |
| PPMP-227-SW/SD02 | KB1002 | 28-Jan-1999 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD02 | KB1002R1 | 1-Jul-1999 | 0 - 0 | Nitroaromatics |
| PPMP-227-SW/SD03 | KB1003 | 28-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD03 | KB1003R1 | 1-Jul-1999 | 0 - 0 | Nitroaromatics |
| PPMP-227-SW/SD04 | KB1004 | 11-Feb-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD04 | KB1004R | 19-Apr-1999 | 0 - 0.5 | OP Pest |
| PPMP-227-SW/SD04 | KB1004R1 | 1-Jul-1999 | 0 - 0 | Nitroaromatics |
| PPMP-227-SW/SD05 | KB0024 | 17-Mar-1999 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-SW/SD05 | KB1005R1 | 1-Jul-1999 | 0 - 0 | Nitroaromatics |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinate biphenyls

## Table C6-8

### Selection of Site-Related Chemicals for Sediment[a]
### Parcels 126 and 227, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 8 / 8 | 100 | 2.87E+03 | 1.97E+04 | 2.52E+01 | 1.12E+02 | 8.02E+03 | 8.59E+03 | 1.43E+04 | Y |
| Arsenic | 8 / 8 | 100 | 2.80E+00 | 6.00E+01 | 1.30E+00 | 5.60E+00 | 1.41E+01 | 1.13E+01 | 2.01E+01 | N (e) |
| Barium | 8 / 8 | 100 | 3.75E+01 | 5.15E+02 | 2.52E+01 | 1.12E+02 | 1.32E+02 | 9.89E+01 | 1.91E+02 | Y |
| Beryllium | 6 / 8 | 75 | 4.40E-01 | 1.30E+00 | 6.30E-01 | 2.80E+00 | 8.71E-01 | 9.70E-01 | 1.24E+00 | Y |
| Calcium | 8 / 8 | 100 | 4.80E+02 | 5.04E+03 | 6.29E+02 | 2.81E+03 | 1.82E+03 | 1.11E+03 | 2.81E+03 | N (d) |
| Chromium | 8 / 8 | 100 | 8.10E+00 | 3.69E+01 | 1.30E+00 | 5.60E+00 | 1.47E+01 | 3.12E+01 | 6.33E+01 | N (b) |
| Cobalt | 6 / 8 | 75 | 3.70E+00 | 6.86E+01 | 6.30E+00 | 2.81E+01 | 1.65E+01 | 1.10E+01 | 2.19E+01 | Y |
| Copper | 8 / 8 | 100 | 7.30E+00 | 4.29E+01 | 3.10E+00 | 1.40E+01 | 1.98E+01 | 1.71E+01 | 3.68E+01 | Y |
| Iron | 8 / 8 | 100 | 7.45E+03 | 1.83E+05 | 1.26E+01 | 5.62E+01 | 4.03E+04 | 3.53E+04 | 5.19E+04 | Y |
| Lead | 8 / 8 | 100 | 1.18E+01 | 1.22E+02 | 3.80E-01 | 1.70E+00 | 5.64E+01 | 3.78E+01 | 7.64E+01 | Y |
| Magnesium | 5 / 8 | 63 | 1.83E+02 | 7.22E+02 | 6.29E+02 | 2.81E+03 | 5.86E+02 | 9.06E+02 | 2.20E+03 | N (a) |
| Manganese | 8 / 8 | 100 | 5.57E+01 | 1.96E+04 | 1.90E+00 | 8.40E+00 | 3.01E+03 | 7.12E+02 | 2.05E+03 | Y |
| Mercury | 6 / 8 | 75 | 2.40E-02 | 1.20E-01 | 4.20E-02 | 1.90E-01 | 6.73E-02 | 1.10E-01 | 1.75E-01 | N (b) |
| Nickel | 7 / 8 | 88 | 4.40E+00 | 2.37E+01 | 5.00E+00 | 2.25E+01 | 1.05E+01 | 1.30E+01 | 3.16E+01 | N (b) |
| Potassium | 5 / 8 | 63 | 1.35E+02 | 3.85E+02 | 6.29E+02 | 2.81E+03 | 5.32E+02 | 1.01E+03 | 2.79E+03 | N (a) |
| Selenium | 5 / 8 | 63 | 6.00E-01 | 3.20E+00 | 6.30E-01 | 2.80E+00 | 1.22E+00 | 7.20E-01 | 1.88E+00 | Y |
| Vanadium | 6 / 8 | 75 | 1.63E+01 | 3.26E+01 | 6.30E+00 | 2.81E+01 | 1.98E+01 | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 7 / 7 | 100 | 1.76E+01 | 9.90E+01 | 2.50E+00 | 1.12E+01 | 3.95E+01 | 5.27E+01 | 1.11E+02 | N (b) |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 2-Butanone | 4 / 6 | 67 | 6.70E-03 | 3.40E-02 | 2.90E-02 | 1.40E-01 | 2.77E-02 | | | Y |
| Acetone | 7 / 7 | 100 | 1.50E-02 | 4.80E-01 | 2.50E-02 | 1.40E-01 | 1.64E-01 | | | Y |
| Carbon disulfide | 2 / 8 | 25 | 7.70E-03 | 2.30E-02 | 6.30E-03 | 3.60E-02 | 9.74E-03 | | | Y |
| Toluene | 2 / 8 | 25 | 3.50E-03 | 6.80E-03 | 6.30E-03 | 3.60E-02 | 7.87E-03 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Sediment is defined as soil from 0 to 1 foot below ground surface.

[b] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

mg/kg = milligrams per kilogram

## Table C6-9

## Selection of Chemicals of Potential Concern for Sediment[a]
## Parcels 126 and 227, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Aluminum | 1.97E+04 | 1.15E+06 | N | NA | NA | 1.15E+06 | N | NA | NA |
| Barium | 5.15E+02 | 8.36E+04 | N | NA | NA | 8.36E+04 | N | NA | NA |
| Beryllium | 1.30E+00 | 1.50E+02 | N | NA | NA | 1.50E+02 | N | NA | NA |
| Cobalt | 6.86E+01 | 6.72E+04 | N | NA | NA | 6.72E+04 | N | NA | NA |
| Copper | 4.29E+01 | 4.74E+04 | N | NA | NA | 4.74E+04 | N | NA | NA |
| Iron | 1.83E+05 | 3.59E+05 | N | NA | NA | 3.59E+05 | N | NA | NA |
| Lead | 1.22E+02 | 4.00E+02 | N | NA | NA | 4.00E+02 | N | NA | NA |
| Manganese | 1.96E+04 | 4.38E+04 | N | NA | NA | 4.38E+04 | N | NA | NA |
| Selenium | 3.20E+00 | 5.96E+03 | N | NA | NA | 5.96E+03 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| 2-Butanone | 3.40E-02 | 6.23E+05 | N | NA | NA | 6.23E+05 | N | NA | NA |
| Acetone | 4.80E-01 | 1.03E+05 | N | NA | NA | 1.03E+05 | N | NA | NA |
| Carbon disulfide | 2.30E-02 | 1.04E+05 | N | NA | NA | 1.04E+05 | N | NA | NA |
| Toluene | 6.80E-03 | 2.11E+05 | N | NA | NA | 2.11E+05 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report*(IT, August 2000).

COPC = Chemical of potential concern.

mg/kg = milligrams per kilogram

NA = not applicable

N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

[a] Sediment is defined as soil from 0 to 1 foot below ground surface.

## Table C6-10

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcels 126 and 227
## Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| FTA-126-GP01 | EF3001 | 17-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-GP02 | EF3002 | 18-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| FTA-126-GP03 | EF3005 | 18-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP01 | KB3001 | 8-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP01 | KB3001R | 29-Jun-1999 | Nitroaromatics |
| PPMP-227-GP02 | KB3002 | 9-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP02 | KB3002R | 29-Jun-1999 | Nitroaromatics |
| PPMP-227-GP03 | KB3003 | 9-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP03 | KB3003R | 28-Jun-1999 | Nitroaromatics |
| PPMP-227-GP04 | KB3004 | 9-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP04 | KB3004R | 28-Jun-1999 | Nitroaromatics |
| PPMP-227-GP05 | KB3005 | 15-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP05 | KB3005R | 29-Jun-1999 | Nitroaromatics |
| PPMP-227-GP06 | KB3006 | 10-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP06 | KB3006R | 1-Jul-1999 | Nitroaromatics |
| PPMP-227-GP07 | KB3007 | 17-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP07 | KB3007R | 30-Jun-1999 | Nitroaromatics |
| PPMP-227-GP08 | KB3008 | 1-Apr-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP08 | KB3008R | 1-Jul-1999 | Nitroaromatics |
| PPMP-227-GP09 | KB3009 | 15-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP09 | KB3009R | 30-Jun-1999 | Nitroaromatics |
| PPMP-227-GP10 | KB3010 | 15-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP10 | KB3010R | 30-Jun-1999 | Nitroaromatics |
| PPMP-227-GP11 | KB3011 | 17-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP11 | KB3011R | 30-Jun-1999 | Nitroaromatics |
| PPMP-227-GP12 | KB3014 | 16-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP12 | KB3014R | 29-Jun-1999 | Nitroaromatics |
| PPMP-227-GP13 | KB3015 | 4-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs |
| PPMP-227-GP13 | KB3015R | 29-Jun-1999 | Nitroaromatics |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinated biphenyls

## Table C6-11

## Selection of Site-Related Chemicals for Groundwater
## Parcels 126 and 227, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 12 / 12 | 100 | 2.17E-01 | 1.63E+01 | 2.00E-01 | 2.00E-01 | 4.48E+00 | 2.34E+00 | 9.60E+00 | Y |
| Arsenic | 9 / 16 | 56 | 3.00E-03 | 1.87E-02 | 1.00E-02 | 1.00E-02 | 6.46E-03 | 1.78E-02 | 2.22E-01 | N (b) |
| Barium | 16 / 16 | 100 | 4.60E-03 | 2.79E-01 | 2.00E-01 | 2.00E-01 | 5.26E-02 | 1.27E-01 | 4.72E-01 | N (b) |
| Beryllium | 5 / 15 | 33 | 1.70E-03 | 3.20E-03 | 5.00E-03 | 5.00E-03 | 2.47E-03 | 1.25E-03 | 2.37E-03 | Y |
| Calcium | 16 / 16 | 100 | 1.35E+00 | 7.75E+01 | 5.00E+00 | 5.00E+00 | 2.38E+01 | 5.65E+01 | 4.52E+00 | N (d) |
| Chromium | 5 / 15 | 33 | 6.70E-03 | 3.58E-02 | 1.00E-02 | 1.00E-02 | 1.17E-02 | | | Y |
| Cobalt | 4 / 16 | 25 | 5.30E-03 | 2.13E-02 | 5.00E-02 | 5.00E-02 | 2.15E-02 | 2.34E-02 | 2.52E-02 | N (a) |
| Copper | 2 / 15 | 13 | 1.26E-02 | 1.31E-01 | 2.50E-02 | 2.50E-02 | 2.04E-02 | 2.55E-02 | 2.35E-01 | N (b) |
| Iron | 12 / 12 | 100 | 2.06E-01 | 2.18E+01 | 1.00E-01 | 1.00E-01 | 6.73E+00 | 7.04E+00 | 2.58E+01 | N (b) |
| Lead | 6 / 16 | 38 | 5.50E-03 | 5.80E-02 | 3.00E-03 | 3.00E-03 | 8.78E-03 | 8.00E-03 | 2.58E-02 | N (e) |
| Magnesium | 16 / 16 | 100 | 8.00E-01 | 4.62E+01 | 5.00E+00 | 5.00E+00 | 1.30E+01 | 2.13E+01 | 1.49E+02 | N (b) |
| Manganese | 16 / 16 | 100 | 3.80E-03 | 7.13E+00 | 1.50E-02 | 1.50E-02 | 7.70E-01 | 5.81E-01 | 4.13E+00 | N (e) |
| Mercury | 7 / 14 | 50 | 5.10E-05 | 2.40E-04 | 2.00E-04 | 2.00E-04 | 9.47E-05 | | | Y |
| Nickel | 5 / 16 | 31 | 1.52E-02 | 3.46E-02 | 4.00E-02 | 4.00E-02 | 2.19E-02 | | | Y |
| Potassium | 10 / 15 | 67 | 7.56E-01 | 5.30E+00 | 5.00E+00 | 5.00E+00 | 2.31E+00 | 7.20E+00 | 6.85E+01 | N (a) |
| Sodium | 3 / 3 | 100 | 5.64E+00 | 1.16E+01 | 5.00E+00 | 5.00E+00 | 8.61E+00 | 1.48E+01 | 4.90E+01 | N (a) |
| Vanadium | 5 / 16 | 31 | 1.29E-02 | 5.34E-02 | 5.00E-02 | 5.00E-02 | 2.75E-02 | 1.70E-02 | 1.14E-02 | Y |
| Zinc | 8 / 16 | 50 | 9.90E-03 | 2.16E-01 | 2.00E-02 | 2.00E-02 | 3.31E-02 | 2.20E-01 | 1.52E+00 | N (a) |
| **Chlorinated Herbicides** | | | | | | | | | | |
| 2,2-Dichloropropanoic Acid (Dalapon) | 1 / 16 | 6 | 3.70E-03 | 3.70E-03 | 2.00E-03 | 2.30E-03 | 1.18E-03 | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 1 / 16 | 6 | 3.90E-03 | 3.90E-03 | 1.00E-02 | 1.00E-02 | 4.93E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| Bromomethane | 1 / 16 | 6 | 1.70E-04 | 1.70E-04 | 2.00E-03 | 2.00E-03 | 9.48E-04 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing (see Appendixes).

mg/L = milligrams per liter

## Table C6-12

## Selection of Chemicals of Potential Concern for Groundwater
## Parcels 126 and 227
## Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | |
| Aluminum | 1.63E+01 | 1.56E+00 | Y | NA | NA | L | 1.10E+01 | 1.10E+01 |
| Beryllium | 3.20E-03 | 3.13E-03 | Y | NA | NA | NP | 2.88E-03 | 2.88E-03 |
| Chromium | 3.58E-02 | 4.69E-03 | Y | NA | NA | NP | 2.51E-02 | 2.51E-02 |
| Mercury | 2.40E-04 | 4.69E-04 | N | NA | NA | | | |
| Nickel | 3.46E-02 | 3.13E-02 | Y | NA | NA | NP | 2.76E-02 | 2.76E-02 |
| Vanadium | 5.34E-02 | 1.10E-02 | Y | NA | NA | NP | 3.86E-02 | 3.86E-02 |
| **Chlorinated Herbicides** | | | | | | | | |
| 2,2-Dichloropropanoic Acid (Dalapon) | 3.70E-03 | 4.68E-02 | N | NA | NA | | | |
| **Semivolatile Organic Compounds** | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 3.90E-03 | 2.85E-02 | N | 4.31E-03 | N | | | |
| **Volatile Organic Compounds** | | | | | | | | |
| Bromomethane | 1.70E-04 | 2.18E-03 | N | NA | NA | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
mg/L = milligrams per liter
NA = not applicable
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C6-13

## Cancer Risk and Noncancer Hazard Estimates for the Resident Exposed to Groundwater
## Parcels 126 and 227
## Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Aluminum | 1.10E+01 | 7.06E-01 | NA |
| Beryllium | 2.88E-03 | 9.19E-02 | NA |
| Chromium | 2.51E-02 | 5.34E-01 | NA |
| Nickel | 2.76E-02 | 8.82E-02 | NA |
| Vanadium | 5.34E-02 | 4.88E-01 | NA |
| **Total HI / ILCR** | | 1.91E+00 | NA |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/L = milligrams per liter
* Hazard from lead in groundwater is evaluated by IEUBK model (see text).

## Table C6-14

## Separation of Noncancer Hazard by Target Organ
## Parcels 126 and 227
## Fort McClellan, Alabama

| COPC | Target Organ Hazard* NS | CNS | ND |
|---|---|---|---|
| ***For Groundwater:*** | | | |
| **Metals** | | | |
| Aluminum | 7.06E-01 | 7.06E-01 | |
| Chromium | | | 5.34E-01 |
| Vanadium | | | 4.88E-01 |
| **Resident HI by Target Organ:** | **7.06E-01** | **7.06E-01** | **1.02E+00** |

COPC = Chemical of potential concern
CNS = Central nervous system
ND = No data
NS = Nervous system
URT = Upper respiratory tract
* See Toxicological Profiles for data regarding selection of target organs.

## Table C6-15

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcels 126 and 227
## Fort McClellan, Alabama

| Medium | Resident | | Recreational Site User | |
|---|---|---|---|---|
| | HI | ILCR | HI | ILCR |
| Surface Soil | NA | NA | NA | NA |
| Groundwater | 1.91E+00 | NA | NA | NA |
| Surface Water | NA | NA | NA | NA |
| Sediment | NA | NA | NA | NA |
| **Total HI / ILCR** | **1.91E+00** | **NA** | **NA** | **NA** |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C7-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 229, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-229-DEP01 | KC0016 | 9-Mar-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |
| PPMP-229-DEP02 | KC0017 | 9-Mar-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |
| PPMP-229-GP01 | KC0001 | 25-Feb-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |
| PPMP-229-GP02 | KC0003 | 15-Feb-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |
| PPMP-229-GP03 | KC0005 | 12-Feb-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |
| PPMP-229-GP04 | KC0007 | 11-Feb-1999 | 0 - 1 | CL Herb, CL Pest, PCB, Metals, Nitro, VOC, SVOC |
| PPMP-229-GP04 | KC0007R | 15-Apr-1999 | 0 - 1 | OP Pest |
| PPMP-229-GP05 | KC0009 | 26-Feb-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |
| PPMP-229-GP06 | KC0011 | 15-Feb-1999 | 0 - 1 | CL Herb, CL Pest, PCB, OP Pest, Metals, Nitro, VOC, SVOC |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
Nitro = Nitroaromatics
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C7-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 229, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 8 / 8 | 100 | 4.79E+03 | 1.10E+04 | 2.32E+01 | 2.76E+01 | 6.97E+03 | 1.63E+04 | 2.14E+04 | N (a) |
| Arsenic | 8 / 8 | 100 | 3.20E+00 | 8.90E+00 | 1.20E+00 | 1.40E+00 | 5.84E+00 | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 8 / 8 | 100 | 2.16E+01 | 1.09E+02 | 2.32E+01 | 2.76E+01 | 5.27E+01 | 1.24E+02 | 1.94E+02 | N (a) |
| Beryllium | 8 / 8 | 100 | 2.00E-01 | 7.40E-01 | 5.80E-01 | 6.90E-01 | 3.64E-01 | 8.00E-01 | 8.68E-01 | N (a) |
| Calcium | 8 / 8 | 100 | 2.27E+02 | 1.06E+03 | 5.80E+02 | 6.91E+02 | 5.54E+02 | 1.72E+03 | 3.54E+03 | N (a) |
| Chromium | 8 / 8 | 100 | 7.50E+00 | 2.74E+01 | 1.20E+00 | 1.40E+00 | 1.46E+01 | 3.70E+01 | 6.44E+01 | N (a) |
| Cobalt | 8 / 8 | 100 | 2.30E+00 | 9.30E+00 | 5.80E+00 | 6.90E+00 | 5.99E+00 | 1.52E+01 | 3.25E+01 | N (a) |
| Copper | 8 / 8 | 100 | 5.10E+00 | 1.53E+01 | 2.90E+00 | 3.50E+00 | 8.28E+00 | 1.27E+01 | 2.25E+01 | N (b) |
| Iron | 8 / 8 | 100 | 9.06E+03 | 3.38E+04 | 1.16E+01 | 1.38E+01 | 1.80E+04 | 3.42E+04 | 5.54E+04 | N (a) |
| Lead | 8 / 8 | 100 | 1.02E+01 | 2.42E+01 | 3.50E-01 | 4.10E-01 | 1.68E+01 | 4.01E+01 | 6.38E+01 | N (a) |
| Magnesium | 8 / 8 | 100 | 1.76E+02 | 3.51E+02 | 5.80E+02 | 6.91E+02 | 2.30E+02 | 1.03E+03 | 9.60E+03 | N (a) |
| Manganese | 8 / 8 | 100 | 1.35E+02 | 1.67E+03 | 1.70E+00 | 2.10E+00 | 6.04E+02 | 1.58E+03 | 4.66E+03 | N (b) |
| Mercury | 8 / 8 | 100 | 3.90E-02 | 1.40E-01 | 3.80E-02 | 4.60E-02 | 8.60E-02 | 8.00E-02 | 3.22E-01 | N (b) |
| Nickel | 8 / 8 | 100 | 2.50E+00 | 7.30E+00 | 4.60E+00 | 5.50E+00 | 4.61E+00 | 1.03E+01 | 2.00E+01 | N (a) |
| Potassium | 8 / 8 | 100 | 1.98E+02 | 3.66E+02 | 5.80E+02 | 6.91E+02 | 2.60E+02 | 8.00E+02 | 6.01E+03 | N (a) |
| Selenium | 8 / 8 | 100 | 5.30E-01 | 1.50E+00 | 5.80E-01 | 6.90E-01 | 8.70E-01 | 4.80E-01 | 1.28E+00 | Y |
| Vanadium | 8 / 8 | 100 | 1.55E+01 | 4.35E+01 | 5.80E+00 | 6.90E+00 | 3.04E+01 | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 8 / 8 | 100 | 1.09E+01 | 4.63E+01 | 2.30E+00 | 2.80E+00 | 1.93E+01 | 4.06E+01 | 7.37E+01 | N (b) |
| **Chlorinated Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 2 / 8 | 25 | 1.60E-03 | 2.00E-03 | 5.90E-03 | 7.00E-03 | 2.83E-03 | | | Y |
| 4,4'-DDT | 1 / 8 | 12.5 | 1.20E-03 | 1.20E-03 | 5.90E-03 | 7.00E-03 | 2.90E-03 | | | Y |
| Endosulfan sulfate | 1 / 8 | 12.5 | 6.00E-03 | 6.00E-03 | 5.90E-03 | 7.00E-03 | 3.49E-03 | | | Y |
| Endrin ketone | 1 / 8 | 12.5 | 1.60E-03 | 1.60E-03 | 5.90E-03 | 7.00E-03 | 2.94E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 1 / 8 | 12.5 | 4.30E-02 | 4.30E-02 | 5.80E-03 | 6.90E-03 | 8.08E-03 | | | Y |
| 1,2-Dimethylbenzene | 1 / 8 | 12.5 | 2.80E-01 | 2.80E-01 | 5.80E-03 | 6.90E-03 | 3.77E-02 | | | Y |
| 1,3,5-Trimethylbenzene | 1 / 8 | 12.5 | 1.10E-02 | 1.10E-02 | 5.80E-03 | 6.90E-03 | 4.08E-03 | | | Y |
| 2-Butanone | 3 / 3 | 100 | 3.50E-03 | 4.70E-03 | 2.30E-02 | 2.70E-02 | 4.07E-03 | | | Y |
| Acetone | 5 / 5 | 100 | 3.40E-02 | 2.20E-01 | 2.30E-02 | 2.80E-02 | 1.03E-01 | | | Y |
| Cumene | 2 / 8 | 25 | 4.00E-03 | 1.60E-02 | 5.80E-03 | 6.90E-03 | 4.83E-03 | | | Y |
| Ethylbenzene | 1 / 8 | 12.5 | 2.60E-01 | 2.60E-01 | 5.80E-03 | 6.90E-03 | 3.52E-02 | | | Y |
| m,p-Xylenes | 1 / 8 | 12.5 | 7.60E-01 | 7.60E-01 | 5.80E-03 | 6.90E-03 | 9.77E-02 | | | Y |
| Naphthalene | 1 / 8 | 12.5 | 2.90E-02 | 2.90E-02 | 5.80E-03 | 6.90E-03 | 6.33E-03 | | | Y |
| n-Butylbenzene | 1 / 8 | 12.5 | 1.40E-02 | 1.40E-02 | 5.80E-03 | 6.90E-03 | 4.45E-03 | | | Y |
| n-Propylbenzene | 1 / 8 | 12.5 | 4.20E-03 | 4.20E-03 | 5.80E-03 | 6.90E-03 | 3.23E-03 | | | Y |
| o-Chlorotoluene | 1 / 8 | 12.5 | 3.10E-03 | 3.10E-03 | 5.80E-03 | 6.90E-03 | 3.09E-03 | | | Y |
| p-Cymene | 2 / 8 | 25 | 5.30E-03 | 9.80E-03 | 5.80E-03 | 6.90E-03 | 4.16E-03 | | | Y |
| Toluene | 1 / 8 | 12.5 | 4.20E-02 | 4.20E-02 | 5.80E-03 | 6.90E-03 | 7.95E-03 | | | Y |
| Trichlorofluoromethane | 2 / 8 | 25 | 4.50E-03 | 6.00E-03 | 1.20E-02 | 1.40E-02 | 6.00E-03 | | | Y |

mg/kg = milligrams per kilogram
UCL = upper confidence limit
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Surface soil is defined as 0 to 1 foot below ground surface.

[b] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C7-3

## Selection of Chemicals of Potential Concern for Surface Soil[a]
## Parcel 229, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Selenium | 1.50E+00 | 3.15E+03 | N | NA | NA | 3.91E+01 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDE | 2.00E-03 | NA | NA | 1.22E+02 | N | NA | NA | 1.79E+00 | N |
| 4,4'-DDT | 1.20E-03 | 2.95E+02 | N | 1.22E+02 | N | 3.83E+00 | N | 1.79E+00 | N |
| Endosulfan sulfate | 6.00E-03 | 3.69E+03 | N | NA | NA | 4.66E+01 | N | NA | NA |
| Endrin ketone | 1.60E-03 | 1.82E+01 | N | NA | NA | 2.32E-01 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 4.30E-02 | 3.08E+04 | N | NA | NA | 3.88E+02 | N | NA | NA |
| 1,2-Dimethylbenzene | 2.80E-01 | 1.24E+06 | N | NA | NA | 1.55E+04 | N | NA | NA |
| 1,3,5-Trimethylbenzene | 1.10E-02 | 3.08E+04 | N | NA | NA | 3.88E+02 | N | NA | NA |
| 2-Butanone | 4.70E-03 | 3.70E+05 | N | NA | NA | 4.66E+03 | N | NA | NA |
| Acetone | 2.20E-01 | 6.16E+04 | N | NA | NA | 7.76E+02 | N | NA | NA |
| Cumene | 1.60E-02 | 6.17E+04 | N | NA | NA | 7.77E+02 | N | NA | NA |
| Ethylbenzene | 2.60E-01 | 6.18E+04 | N | NA | NA | 7.77E+02 | N | NA | NA |
| m,p-Xylenes | 7.60E-01 | 1.24E+06 | N | NA | NA | 1.55E+04 | N | NA | NA |
| Naphthalene | 2.90E-02 | 1.24E+04 | N | NA | NA | 1.55E+02 | N | NA | NA |
| n-Butylbenzene | 1.40E-02 | 6.17E+03 | N | NA | NA | 7.77E+01 | N | NA | NA |
| n-Propylbenzene | 4.20E-03 | 6.17E+03 | N | NA | NA | 7.77E+01 | N | NA | NA |
| o-Chlorotoluene | 3.10E-03 | 1.24E+04 | N | NA | NA | 1.55E+02 | N | NA | NA |
| p-Cymene | 9.80E-03 | 1.23E+05 | N | NA | NA | 1.55E+03 | N | NA | NA |
| Toluene | 4.20E-02 | 1.24E+05 | N | NA | NA | 1.55E+03 | N | NA | NA |
| Trichlorofluoromethane | 6.00E-03 | 1.85E+05 | N | NA | NA | 2.33E+03 | N | NA | NA |

mg/kg = milligrams per kilogram
NA = not applicable
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C7-4

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 229, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-229-SW/SD01 | KC2001 | 10-Feb-1999 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, VOC, SVOC |
| PPMP-229-SW/SD02 | KC2002 | 10-Feb-1999 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, VOC, SVOC |
| PPMP-229-SW/SD03 | KC2003 | 11-Feb-1999 | CL Herb, CL Pest, Metals, Nitro, OP Pest, PCB, VOC, SVOC |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
Nitro = Nitroaromatics
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C7-5

## Selection of Site-Related Chemicals for Surface Water
## Parcel 229, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 2.36E+00 | 2.51E+00 | 2.00E-01 | 2.00E-01 | 5.26E+00 | 1.70E+01 | N (a) |
| Barium | 3 / 3 | 100 | 4.22E-02 | 5.08E-02 | 2.00E-01 | 2.00E-01 | 7.54E-02 | 1.13E-01 | N (a) |
| Calcium | 3 / 3 | 100 | 8.57E+00 | 1.30E+01 | 5.00E+00 | 5.00E+00 | 2.52E+01 | 6.41E+01 | N (a) |
| Iron | 3 / 3 | 100 | 2.40E+00 | 2.47E+00 | 1.00E-01 | 1.00E-01 | 1.96E+01 | 4.12E+01 | N (a) |
| Magnesium | 3 / 3 | 100 | 2.66E+00 | 4.48E+00 | 5.00E+00 | 5.00E+00 | 1.10E+01 | 2.44E+01 | N (a) |
| Manganese | 3 / 3 | 100 | 9.72E-02 | 1.39E-01 | 1.50E-02 | 1.50E-02 | 5.65E-01 | 1.83E+00 | N (a) |
| Mercury | 3 / 3 | 100 | 4.80E-05 | 6.20E-05 | 2.00E-04 | 2.00E-04 | | | Y |
| Potassium | 2 / 2 | 100 | 1.89E+00 | 2.08E+00 | 5.00E+00 | 5.00E+00 | 2.56E+00 | 4.25E+00 | N (a) |
| Sodium | 1 / 1 | 100 | 2.45E+00 | 2.45E+00 | 5.00E+00 | 5.00E+00 | 3.44E+00 | 1.52E+01 | N (a) |
| Zinc | 3 / 3 | 100 | 1.63E-02 | 1.88E-02 | 2.00E-02 | 2.00E-02 | 4.04E-02 | 1.82E-01 | N (a) |

mg/L = milligrams per liter

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C7-6

## Selection of Chemicals of Potential Concern for Surface Water
## Parcel 229, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Mercury | 6.20E-05 | 4.25E-03 | N | NA | NA | 4.25E-03 | N | NA | NA |

mg/L = milligrams per liter
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C7-7

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 229, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-229-SW/SD01 | KC1001 | 10-Feb-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-229-SW/SD02 | KC1002 | 10-Feb-1999 | 0 - 1 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-229-SW/SD02 | KC1002R | 19-Apr-1999 | 0 - 0.5 | OP Pest |
| PPMP-229-SW/SD03 | KC1003 | 11-Feb-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, Nitro, PCB, SVOC, VOC |
| PPMP-229-SW/SD03 | KC1003R | 19-Apr-1999 | 0 - 0.5 | OP Pest |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
Nitro = Nitroaromatics
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C7-8

## Selection of Site-Related Chemicals for Sediment[a]
## Parcel 229, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 1.81E+03 | 5.65E+03 | 2.49E+01 | 2.81E+01 | 8.59E+03 | 1.43E+04 | N (a) |
| Arsenic | 3 / 3 | 100 | 9.30E-01 | 3.60E+00 | 1.20E+00 | 1.40E+00 | 1.13E+01 | 2.01E+01 | N (a) |
| Barium | 3 / 3 | 100 | 1.44E+01 | 7.35E+02 | 2.49E+01 | 2.81E+01 | 9.89E+01 | 1.91E+02 | Y |
| Beryllium | 3 / 3 | 100 | 1.20E-01 | 2.20E+00 | 6.20E-01 | 7.00E-01 | 9.70E-01 | 1.24E+00 | Y |
| Cadmium | 1 / 3 | 33 | 2.50E+00 | 2.50E+00 | 6.20E-01 | 7.00E-01 | 4.30E-01 | 1.36E+00 | Y |
| Calcium | 3 / 3 | 100 | 3.16E+02 | 6.66E+02 | 6.22E+02 | 7.03E+02 | 1.11E+03 | 2.81E+03 | N (a) |
| Chromium | 3 / 3 | 100 | 3.20E+00 | 9.70E+00 | 1.20E+00 | 1.40E+00 | 3.12E+01 | 6.33E+01 | N (a) |
| Cobalt | 3 / 3 | 100 | 7.30E-01 | 6.20E+01 | 6.20E+00 | 7.00E+00 | 1.10E+01 | 2.19E+01 | Y |
| Copper | 3 / 3 | 100 | 2.60E+00 | 2.10E+01 | 3.10E+00 | 3.50E+00 | 1.71E+01 | 3.68E+01 | N (b) |
| Iron | 3 / 3 | 100 | 3.53E+03 | 2.33E+04 | 1.24E+01 | 1.41E+01 | 3.53E+04 | 5.19E+04 | N (a) |
| Lead | 3 / 3 | 100 | 3.70E+00 | 3.13E+01 | 3.70E-01 | 4.20E-01 | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 3 / 3 | 100 | 1.24E+02 | 1.49E+03 | 6.22E+02 | 7.03E+02 | 9.06E+02 | 2.20E+03 | N (b) |
| Manganese | 3 / 3 | 100 | 5.55E+01 | 9.50E+03 | 1.90E+00 | 8.00E+00 | 7.12E+02 | 2.05E+03 | Y |
| Mercury | 3 / 3 | 100 | 2.70E-02 | 4.80E-02 | 4.10E-02 | 4.60E-02 | 1.10E-01 | 1.75E-01 | N (a) |
| Nickel | 2 / 3 | 67 | 2.07E+01 | 7.11E+01 | 5.00E+00 | 5.60E+00 | 1.30E+01 | 3.16E+01 | Y |
| Potassium | 2 / 2 | 100 | 1.85E+02 | 1.13E+03 | 6.63E+02 | 7.03E+02 | 1.01E+03 | 2.79E+03 | N (b) |
| Selenium | 2 / 3 | 67 | 9.90E-01 | 2.00E+00 | 6.20E-01 | 7.00E-01 | 7.20E-01 | 1.88E+00 | Y |
| Vanadium | 3 / 3 | 100 | 7.00E+00 | 2.40E+01 | 6.20E+00 | 7.00E+00 | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 3 / 3 | 100 | 5.30E+00 | 1.18E+02 | 2.50E+00 | 2.80E+00 | 5.27E+01 | 1.11E+02 | Y |
| **Volatile Organic Compounds** | | | | | | | | | |
| p-Cymene | 1 / 3 | 33 | 7.50E-03 | 7.50E-03 | 6.20E-03 | 7.00E-03 | | | Y |

mg/kg = milligrams per kilogram
UCL = upper confidence limit
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Sediment is defined from 0 to 1 foot below ground surface.

[b] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C7-9

## Selection of Chemicals of Potential Concern for Sediment[a]
## Parcel 229, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Barium | 7.35E+02 | 8.36E+04 | N | NA | NA | 8.36E+04 | N | NA | NA |
| Beryllium | 2.20E+00 | 1.50E+02 | N | NA | NA | 1.50E+02 | N | NA | NA |
| Cadmium | 2.50E+00 | 1.71E+02 | N | NA | NA | 1.71E+02 | N | NA | NA |
| Cobalt | 6.20E+01 | 6.72E+04 | N | NA | NA | 6.72E+04 | N | NA | NA |
| Manganese | 9.50E+03 | 4.38E+04 | N | NA | NA | 4.38E+04 | N | NA | NA |
| Nickel | 7.11E+01 | 1.76E+04 | N | NA | NA | 1.76E+04 | N | NA | NA |
| Selenium | 2.00E+00 | 5.96E+03 | N | NA | NA | 5.96E+03 | N | NA | NA |
| Zinc | 1.18E+02 | 3.44E+05 | N | NA | NA | 3.44E+05 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| p-Cymene | 7.50E-03 | 2.08E+05 | N | NA | NA | 2.08E+05 | N | NA | NA |

mg/kg = milligrams per kilogram
COPC = Chemical of potential concern
NA = Not applicable
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Sediment is defined from 0 to 1 foot below ground surface.

## Table C7-10

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 229, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-229-GP01 | KC3001 | 23-Mar-1999 | CL Herb, PCBs, CL Pest, OP Pest, Metals, Nitro, SVOCs, VOCs |
| PPMP-229-GP02 | KC3002 | 22-Mar-1999 | CL Herb, PCBs, CL Pest, OP Pest, Metals, Nitro, SVOCs, VOCs |
| PPMP-229-GP03 | KC3005 | 22-Mar-1999 | CL Herb, PCBs, CL Pest, OP Pest, Metals, Nitro, SVOCs, VOCs |
| PPMP-229-GP04 | KC3006 | 18-Mar-1999 | CL Herb, PCBs, CL Pest, OP Pest, Metals, Nitro, SVOCs, VOCs |
| PPMP-229-GP07 | KC3007 | 22-Mar-1999 | CL Herb, PCBs, CL Pest, OP Pest, Metals, Nitro, SVOCs, VOCs |
| PPMP-229-GP05 | KC3008 | 23-Mar-1999 | CL Herb, PCBs, CL Pest, OP Pest, Metals, Nitro, SVOCs, VOCs |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
Nitro = Nitroaromatics
PCBs = Polychlorinated Biphenyls
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds

## Table C7-11

### Selection of Site-Related Chemicals for Groundwater
### Parcel 229, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 3 / 3 | 100 | 2.12E-01 | 1.01E+01 | 2.00E-01 | 2.00E-01 | 3.53E+00 | 2.34E+00 | 9.60E+00 | Y |
| Barium | 6 / 6 | 100 | 1.13E-02 | 5.23E-01 | 2.00E-01 | 2.00E-01 | 2.09E-01 | 1.27E-01 | 4.72E-01 | Y |
| Calcium | 6 / 6 | 100 | 1.64E+00 | 1.96E+02 | 5.00E+00 | 5.00E+00 | 5.13E+01 | 5.65E+01 | 4.52E+02 | N (b) |
| Chromium | 1 / 6 | 17 | 1.37E-02 | 1.37E-02 | 1.00E-02 | 1.00E-02 | 6.45E-03 | | | Y |
| Cobalt | 1 / 6 | 17 | 7.20E-03 | 7.20E-03 | 5.00E-02 | 5.00E-02 | 2.20E-02 | 2.34E-02 | 2.52E-02 | N (a) |
| Copper | 1 / 6 | 17 | 1.00E-02 | 1.00E-02 | 2.50E-02 | 2.50E-02 | 1.21E-02 | 2.55E-02 | 2.35E-01 | N (a) |
| Iron | 5 / 5 | 100 | 1.03E-01 | 4.91E+01 | 1.00E-01 | 1.00E-01 | 2.84E+01 | 7.04E+00 | 2.58E+01 | Y |
| Lead | 1 / 6 | 17 | 6.30E-03 | 6.30E-03 | 3.00E-03 | 3.00E-03 | 2.30E-03 | 8.00E-03 | 2.58E-02 | N (a) |
| Magnesium | 6 / 6 | 100 | 1.00E+00 | 1.32E+01 | 5.00E+00 | 5.00E+00 | 6.15E+00 | 2.13E+01 | 1.49E+02 | N(b) |
| Manganese | 6 / 6 | 100 | 6.18E-02 | 1.39E+00 | 1.50E-02 | 1.50E-02 | 6.09E-01 | 5.81E-01 | 4.13E+00 | N (b) |
| Nickel | 2 / 6 | 33 | 1.15E-02 | 1.54E-02 | 4.00E-02 | 4.00E-02 | 1.78E-02 | | | Y |
| Potassium | 5 / 6 | 83 | 2.02E+00 | 1.81E+01 | 5.00E+00 | 5.00E+00 | 6.49E+00 | 7.20E+00 | 6.85E+01 | N (b) |
| Sodium | 3 / 3 | 100 | 3.89E+00 | 1.78E+01 | 5.00E+00 | 5.00E+00 | 9.03E+00 | 1.48E+01 | 4.90E+01 | N(b) |
| Vanadium | 1 / 6 | 17 | 1.75E-02 | 1.75E-02 | 5.00E-02 | 5.00E-02 | 2.38E-02 | 1.70E-02 | 1.14E-02 | Y |
| Zinc | 3 / 6 | 50 | 2.03E-02 | 5.64E-02 | 2.00E-02 | 2.00E-02 | 2.34E-02 | 2.20E-01 | 1.52E+00 | N (a) |
| **Nitroaromatics** | | | | | | | | | | |
| RDX | 2 / 6 | 33 | 4.30E-03 | 4.50E-03 | 5.00E-04 | 2.00E-03 | 1.76E-03 | | | Y |
| **Chlorinated Pesticides** | | | | | | | | | | |
| 4,4'-DDD | 1 / 6 | 17 | 3.00E-05 | 3.00E-05 | 5.00E-05 | 5.00E-05 | 2.58E-05 | | | Y |
| **Semivolatile Organics** | | | | | | | | | | |
| 2-Methylnaphthalene | 1 / 6 | 17 | 1.30E-03 | 1.30E-03 | 1.00E-02 | 1.00E-02 | 4.38E-03 | | | Y |
| Acenaphthene | 1 / 6 | 17 | 2.10E-03 | 2.10E-03 | 1.00E-02 | 1.00E-02 | 4.52E-03 | | | Y |
| bis(2-Ethylhexyl)phthalate | 1 / 6 | 17 | 3.00E-03 | 3.00E-03 | 1.00E-02 | 1.00E-02 | 4.67E-03 | | | Y |
| Dibenzofuran | 1 / 6 | 17 | 1.50E-03 | 1.50E-03 | 1.00E-02 | 1.00E-02 | 4.42E-03 | | | Y |
| Fluorene | 1 / 6 | 17 | 1.90E-03 | 1.90E-03 | 1.00E-02 | 1.00E-02 | 4.48E-03 | | | Y |
| **Volatile Organics** | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 1 / 6 | 17 | 1.50E-04 | 1.50E-04 | 1.00E-03 | 1.00E-03 | 4.42E-04 | | | Y |
| 1,2-Dimethylbenzene | 1 / 6 | 17 | 1.30E-04 | 1.30E-04 | 1.00E-03 | 1.00E-03 | 4.38E-04 | | | Y |
| 1,3,5-Trimethylbenzene | 1 / 6 | 17 | 2.40E-04 | 2.40E-04 | 1.00E-03 | 1.00E-03 | 4.57E-04 | | | Y |
| 1,4-Dichlorobenzene | 3 / 6 | 50 | 3.70E-04 | 6.20E-03 | 1.00E-03 | 1.00E-03 | 1.50E-03 | | | Y |
| Benzene | 2 / 6 | 33 | 1.00E-04 | 2.40E-04 | 1.00E-03 | 1.00E-03 | 3.90E-04 | | | Y |
| Cumene | 1 / 6 | 17 | 5.30E-04 | 5.30E-04 | 1.00E-03 | 1.00E-03 | 5.05E-04 | | | Y |
| Naphthalene | 3 / 6 | 50 | 3.20E-04 | 1.60E-01 | 1.00E-03 | 1.00E-02 | 2.71E-02 | | | Y |
| n-Butylbenzene | 1 / 6 | 17 | 4.30E-04 | 4.30E-04 | 1.00E-03 | 1.00E-03 | 4.88E-04 | | | Y |
| n-Propylbenzene | 1 / 6 | 17 | 6.00E-04 | 6.00E-04 | 1.00E-03 | 1.00E-03 | 5.17E-04 | | | Y |
| o-Chlorotoluene | 1 / 6 | 17 | 1.80E-04 | 1.80E-04 | 1.00E-03 | 1.00E-03 | 4.47E-04 | | | Y |
| p-Cymene | 3 / 6 | 50 | 1.40E-04 | 3.50E-04 | 1.00E-03 | 1.00E-03 | 3.63E-04 | | | Y |
| sec-Butylbenzene | 2 / 6 | 33 | 1.10E-04 | 5.90E-04 | 1.00E-03 | 1.00E-03 | 4.50E-04 | | | Y |
| tert-Butylbenzene | 1 / 6 | 17 | 2.20E-04 | 2.20E-04 | 1.00E-03 | 1.00E-03 | 4.53E-04 | | | Y |
| Trichloroethene | 1 / 6 | 17 | 1.60E-04 | 1.60E-04 | 1.00E-03 | 1.00E-03 | 4.43E-04 | | | Y |
| Vinyl chloride | 1 / 6 | 17 | 6.80E-04 | 6.80E-04 | 2.00E-03 | 2.00E-03 | 9.47E-04 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

mg/L = milligrams per liter

UCL = upper confidence limit

UTL = upper tolerance limit

## Table C7-12

### Selection of Chemicals of Potential Concern for Groundwater
### Parcel 229, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Residential Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | |
| Aluminum | 1.01E+01 | 1.56E+00 | Y | NA | NA | NA | NA | 1.01E+01 |
| Barium | 5.23E-01 | 1.10E-01 | Y | NA | NA | L | 5.78E-01 | 5.23E-01 |
| Chromium | 1.37E-02 | 4.69E-03 | Y | NA | NA | NP | 1.29E-02 | 1.29E-02 |
| Iron | 4.91E+01 | 4.69E-01 | Y | NA | NA | N | 4.84E+01 | 4.84E+01 |
| Nickel | 1.54E-02 | 3.13E-02 | N | NA | NA | | | |
| Vanadium | 1.75E-02 | 1.10E-02 | Y | NA | NA | NP | 2.93E-02 | 1.75E-02 |
| **Nitroaromatics** | | | | | | | | |
| RDX | 4.50E-03 | 4.69E-03 | N | 6.69E-04 | Y | NP | 5.53E-03 | 4.50E-03 |
| **Chlorinated Pesticides** | | | | | | | | |
| 4,4'-DDD | 3.00E-05 | NA | NA | 1.83E-04 | N | | | |
| **Semivolatile Organic Compounds** | | | | | | | | |
| 2-Methylnaphthalene | 1.30E-03 | 2.48E-02 | N | NA | NA | | | |
| Acenaphthene | 2.10E-03 | 6.58E-02 | N | NA | NA | | | |
| bis(2-Ethylhexyl)phthalate | 3.00E-03 | 2.85E-02 | N | 4.31E-03 | N | | | |
| Dibenzofuran | 1.50E-03 | 4.34E-03 | N | NA | NA | | | |
| Fluorene | 1.90E-03 | 4.66E-02 | N | NA | NA | | | |
| **Volatile Organic Compounds** | | | | | | | | |
| 1,2,4-Trimethylbenzene | 1.50E-04 | 6.00E-03 | N | NA | NA | | | |
| 1,2-Dimethylbenzene | 1.30E-04 | 2.80E+00 | N | NA | NA | | | |
| 1,3,5-Trimethylbenzene | 2.40E-04 | 6.00E-03 | N | NA | NA | | | |
| 1,4-Dichlorobenzene | 6.20E-03 | 4.26E-02 | N | 1.76E-03 | Y | NP | 5.72E-03 | 5.72E-03 |
| Benzene | 2.40E-04 | 3.96E-03 | N | 1.41E-03 | N | | | |
| Cumene | 5.30E-04 | 1.27E-01 | N | NA | NA | | | |
| Naphthalene | 1.60E-01 | 3.01E-03 | Y | NA | NA | NP | 1.46E-01 | 1.46E-01 |
| n-Butylbenzene | 4.30E-04 | 9.57E-03 | N | NA | NA | | | |
| n-Propylbenzene | 6.00E-04 | 1.30E-02 | N | NA | NA | | | |
| o-Chlorotoluene | 1.80E-04 | 2.82E-02 | N | NA | NA | | | |
| p-Cymene | 3.50E-04 | 2.26E-01 | N | NA | NA | | | |
| sec-Butylbenzene | 5.90E-04 | 1.06E-02 | N | NA | NA | | | |
| tert-Butylbenzene | 2.20E-04 | 1.14E-02 | N | NA | NA | | | |
| Trichloroethene | 1.60E-04 | 9.15E-03 | N | 4.51E-03 | N | | | |
| Vinyl chloride | 6.80E-04 | NA | NA | 3.20E-05 | Y | NP | 1.19E-03 | 6.80E-04 |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
UCL = Upper confidence limit
mg/L = milligrams per liter
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C7-13

## Cancer Risk and Noncancer Hazard Estimates for the Resident Exposed to Groundwater Parcel 229, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Aluminum | 1.01E+01 | 6.46E-01 | NA |
| Barium | 5.23E-01 | 4.78E-01 | NA |
| Chromium | 1.29E-02 | 2.76E-01 | NA |
| Iron | 4.84E+01 | 1.03E+01 | NA |
| Vanadium | 1.75E-02 | 1.60E-01 | NA |
| **Nitroaromatics** | | | |
| RDX | 4.50E-03 | NA | 6.72E-06 |
| **Volatile Organics** | | | |
| 1,4-Dichlorobenzene | 5.72E-03 | NA | 3.25E-06 |
| Naphthalene | 1.46E-01 | 4.85E+00 | NA |
| Vinyl chloride | 6.80E-04 | NA | 2.12E-05 |
| **Total HI / ILCR** | | **1.67E+01** | **3.12E-05** |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/L = milligrams per liter

## Table C7-14

## Separation of Noncancer Hazard by Target Organ for the Resident Parcel 229, Fort McClellan, Alabama

| COPC | Target Organ Hazard* | | | | | |
|---|---|---|---|---|---|---|
| | NS | CNS | CVS | Kidney | Erythrocytes | ND |
| ***For Groundwater:*** | | | | | | |
| **Metals** | | | | | | |
| Aluminum | 6.46E-01 | 6.46E-01 | | | | |
| Barium | | | 4.78E-01 | 4.78E-01 | | |
| Chromium | | | | | | 2.76E-01 |
| Vanadium | | | | | | 1.60E-01 |
| **Volatile Organics** | | | | | | |
| Naphthalene | | | | | 4.85E+00 | |
| **Resident HI by Target Organ:** | **6.46E-01** | **6.46E-01** | **4.78E-01** | **4.78E-01** | **4.85E+00** | **4.35E-01** |

COPC = Chemical of potential concern
HI = Hazard Index
Target Organs: CVS = Cardiovascular System; GI = Gastrointestinal ; NS = Neurological System;
ND = No data
* See Toxicological Profiles for data regarding selection of target organs.

## Table C7-15

## Remedial Goal Options Based on Noncancer for the Resident Groundwater
## Parcel 229, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/L) | MCL[a] (mg/L) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/L) Based on an HI of: 0.1 | 1 | 3 |
|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | |
| Naphthalene | 1.46E-01 | ND | 4.85E+00 | 3.01E-03 | 3.01E-02 | 9.03E-02 |

COC = Chemical of concern
HI = Hazard index
MCL = Maximum contaminant level
mg/L = milligrams per liter
ND = No data
a = US Environmental Protection Agency, *National Primary Drinking Water Regulations*, March 2001, online.

## Table C7-16

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcel 229, Fort McClellan, Alabama

| Medium | Resident | | Recreational Site User | |
|---|---|---|---|---|
| | HI | ILCR | HI | ILCR |
| Surface Soil | NA | NA | NA | NA |
| Total Soil | NA | NA | NA | NA |
| Groundwater | 1.67E+01 | 3.12E-05 | NA | NA |
| Surface Water | NA | NA | NA | NA |
| Sediment | NA | NA | NA | NA |
| **Total HI / ILCR** | **1.67E+01** | **3.12E-05** | **NA** | **NA** |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C8-1
## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 231, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-231-DEP01 | KT0024 | 10-Mar-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-231-DEP02 | KT0030 | 25-Mar-99 | 0 - 0.25 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, OP Pest, Exp |
| PPMP-231-DEP03 | KT0031 | 25-Mar-99 | 0 - 0.3 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, OP Pest, Exp |
| PPMP-231-GP01 | KT0001 | 25-Jan-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-231-GP02 | KT0003 | 1-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-231-GP03 | KT0005 | 27-Jan-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro |
| PPMP-231-GP03 | KT0005R | 13-Apr-99 | 0 - 1 | OP Pesticides |
| PPMP-231-GP04 | KT0007 | 3-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro |
| PPMP-231-GP04 | KT0007R | 13-Apr-99 | 0 - 1 | OP Pesticides |
| PPMP-231-GP05 | KT0009 | 10-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro |
| PPMP-231-GP06 | KT0013 | 4-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-231-GP07 | KT0016 | 4-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-231-GP08 | KT0018 | 10-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro |
| PPMP-231-GP08 | KT0018R | 16-Apr-99 | 0 - 1 | OP Pesticides |
| PPMP-231-GP09 | KT0020 | 4-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |
| PPMP-231-GP10 | KT0021 | 3-Feb-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro |
| PPMP-231-GP10 | KT0021R | 13-Apr-99 | 0 - 1 | OP Pesticides |
| PPMP-231-GP11 | KT0025 | 25-Jan-99 | 0 - 1 | CL Herb, CL Pest, Metals, SVOCs, VOCs, PCBs, Nitro, OP Pest |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
PCBs - Polychlorinated biphenyls
Nitro - Nitroaromatics
Exp - Explosives
OP Pest - Organophosphate Pesticides

## Table C8-2

## Selection of Site-Related Chemicals for Surface Soil[a]
## Parcel 231, Fort McClellan, Alabama

(Page 1 of 2)

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 14 / 14 | 100 | 3.91E+03 | 1.53E+04 | 2.26E+01 | 2.71E+01 | 7.35E+03 | 1.63E+04 | 2.14E+04 | N (a) |
| Antimony | 2 / 14 | 14 | 2.80E-01 | 1.10E+00 | 6.80E+00 | 8.10E+00 | 3.14E+00 | 1.99E+00 | 2.64E+00 | N (a) |
| Arsenic | 14 / 14 | 100 | 2.40E+00 | 1.45E+01 | 1.10E+00 | 1.40E+00 | 5.47E+00 | 1.37E+01 | 2.54E+01 | N (b) |
| Barium | 14 / 14 | 100 | 9.90E+00 | 8.68E+01 | 2.26E+01 | 2.71E+01 | 4.43E+01 | 1.24E+02 | 1.94E+02 | N (a) |
| Beryllium | 11 / 11 | 100 | 2.50E-01 | 8.40E-01 | 5.60E-01 | 6.80E-01 | 4.95E-01 | 8.00E-01 | 8.68E-01 | N (b) |
| Cadmium | 2 / 14 | 14 | 5.00E-02 | 2.90E-01 | 5.60E-01 | 6.80E-01 | 2.78E-01 | 2.90E-01 | 2.09E-01 | N (a) |
| Calcium | 14 / 14 | 100 | 8.94E+01 | 7.64E+03 | 5.64E+02 | 6.78E+02 | 9.43E+02 | 1.72E+03 | 3.54E+03 | N (d) |
| Chromium | 14 / 14 | 100 | 5.00E+00 | 2.72E+01 | 1.10E+00 | 1.40E+00 | 1.28E+01 | 3.70E+01 | 6.44E+01 | N (a) |
| Cobalt | 14 / 14 | 100 | 8.60E-01 | 1.11E+01 | 5.60E+00 | 6.80E+00 | 4.53E+00 | 1.52E+01 | 3.25E+01 | N (a) |
| Copper | 14 / 14 | 100 | 2.40E+00 | 2.63E+01 | 2.80E+00 | 3.40E+00 | 1.03E+01 | 1.27E+01 | 2.25E+01 | Y |
| Iron | 14 / 14 | 100 | 8.19E+03 | 4.47E+04 | 1.13E+01 | 1.36E+01 | 1.78E+04 | 3.42E+04 | 5.54E+04 | N (b) |
| Lead | 14 / 14 | 100 | 5.50E+00 | 9.26E+01 | 3.40E-01 | 4.10E-01 | 3.19E+01 | 4.01E+01 | 6.38E+01 | Y |
| Magnesium | 14 / 14 | 100 | 9.83E+01 | 3.31E+03 | 5.64E+02 | 6.78E+02 | 5.26E+02 | 1.03E+03 | 9.60E+03 | N (b) |
| Manganese | 14 / 14 | 100 | 8.10E+01 | 1.07E+03 | 1.70E+00 | 2.00E+00 | 5.28E+02 | 1.58E+03 | 4.66E+03 | N (a) |
| Mercury | 12 / 12 | 100 | 3.50E-02 | 1.40E-01 | 3.70E-02 | 1.30E-01 | 5.87E-02 | 8.00E-02 | 3.22E-01 | N (b) |
| Nickel | 13 / 13 | 100 | 3.20E+00 | 1.26E+01 | 4.50E+00 | 5.40E+00 | 5.53E+00 | 1.03E+01 | 2.00E+01 | N (b) |
| Potassium | 11 / 12 | 92 | 9.40E+01 | 5.05E+02 | 5.64E+02 | 6.78E+02 | 2.97E+02 | 8.00E+02 | 6.01E+03 | N (a) |
| Selenium | 12 / 13 | 92 | 3.00E-01 | 1.50E+00 | 5.60E-01 | 6.80E-01 | 6.61E-01 | 4.80E-01 | 1.28E+00 | Y |
| Vanadium | 14 / 14 | 100 | 1.43E+01 | 6.33E+01 | 5.60E+00 | 6.80E+00 | 2.61E+01 | 5.88E+01 | 9.94E+01 | N (b) |
| Zinc | 14 / 14 | 100 | 5.00E+00 | 4.35E+01 | 2.30E+00 | 2.70E+00 | 1.94E+01 | 4.06E+01 | 7.37E+01 | N (b) |
| **Chlorinated Pesticides** | | | | | | | | | | |
| 4,4'-DDE | 2 / 14 | 14 | 1.50E-02 | 2.30E-02 | 1.90E-03 | 1.00E-02 | 5.02E-03 | | | Y |
| 4,4'-DDT | 2 / 14 | 14 | 1.70E-02 | 3.90E-02 | 1.90E-03 | 1.00E-02 | 6.30E-03 | | | Y |
| Aldrin | 1 / 14 | 7 | 8.20E-04 | 8.20E-04 | 1.90E-03 | 1.00E-02 | 2.51E-03 | | | Y |
| delta-BHC | 1 / 14 | 7 | 2.70E-03 | 2.70E-03 | 1.90E-03 | 1.00E-02 | 2.64E-03 | | | Y |
| Endosulfan sulfate | 1 / 14 | 7 | 1.00E-03 | 1.00E-03 | 1.90E-03 | 1.00E-02 | 2.52E-03 | | | Y |
| Endrin ketone | 1 / 14 | 7 | 1.80E-03 | 1.80E-03 | 1.90E-03 | 1.00E-02 | 2.58E-03 | | | Y |

## Table C8-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 231, Fort McClellan, Alabama



| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Acenaphthylene | 1 / 14 | 7 | 1.90E-01 | 1.90E-01 | 3.70E-01 | 4.50E-01 | 1.96E-01 | | | Y |
| Anthracene | 1 / 14 | 7 | 1.60E-01 | 1.60E-01 | 3.70E-01 | 4.50E-01 | 1.94E-01 | | | Y |
| Benzo(a)anthracene | 1 / 14 | 7 | 1.20E-01 | 1.20E-01 | 3.70E-01 | 4.50E-01 | 1.91E-01 | | | Y |
| Benzo(a)pyrene | 1 / 14 | 7 | 1.80E-01 | 1.80E-01 | 3.70E-01 | 4.50E-01 | 1.95E-01 | | | Y |
| Benzo(b)fluoranthene | 1 / 14 | 7 | 2.00E-01 | 2.00E-01 | 3.70E-01 | 4.50E-01 | 1.97E-01 | | | Y |
| Benzo(ghi)perylene | 1 / 14 | 7 | 2.00E-01 | 2.00E-01 | 3.70E-01 | 4.50E-01 | 1.97E-01 | | | Y |
| Benzo(k)fluoranthene | 1 / 14 | 7 | 1.90E-01 | 1.90E-01 | 3.70E-01 | 4.50E-01 | 1.96E-01 | | | Y |
| Carbazole | 1 / 14 | 7 | 8.20E-02 | 8.20E-02 | 3.70E-01 | 4.50E-01 | 1.88E-01 | | | Y |
| Chrysene | 1 / 14 | 7 | 1.30E-01 | 1.30E-01 | 3.70E-01 | 4.50E-01 | 1.92E-01 | | | Y |
| Dibenz(a,h)anthracene | 1 / 14 | 7 | 6.10E-02 | 6.10E-02 | 3.70E-01 | 4.50E-01 | 1.87E-01 | | | Y |
| Di-n-butyl phthalate | 1 / 11 | 9 | 6.70E-02 | 6.70E-02 | 3.70E-01 | 4.50E-01 | 1.86E-01 | | | Y |
| Fluoranthene | 1 / 14 | 7 | 1.60E-01 | 1.60E-01 | 3.70E-01 | 4.50E-01 | 1.94E-01 | | | Y |
| Indeno(1,2,3-cd)pyrene | 1 / 14 | 7 | 1.50E-01 | 1.50E-01 | 3.70E-01 | 4.50E-01 | 1.93E-01 | | | Y |
| Phenanthrene | 1 / 14 | 7 | 5.50E-02 | 5.50E-02 | 3.70E-01 | 4.50E-01 | 1.86E-01 | | | Y |
| Pyrene | 1 / 14 | 7 | 1.70E-01 | 1.70E-01 | 3.70E-01 | 4.50E-01 | 1.95E-01 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 1 / 14 | 7 | 4.10E-03 | 4.10E-03 | 5.60E-03 | 6.80E-03 | 3.05E-03 | | | Y |
| 2-Butanone | 2 / 2 | 100 | 3.40E-03 | 4.60E-03 | 2.40E-02 | 2.70E-02 | 4.00E-03 | | | Y |
| Acetone | 5 / 5 | 100 | 1.40E-02 | 4.90E-01 | 2.30E-02 | 1.20E+00 | 1.34E-01 | | | Y |
| Bromomethane | 1 / 11 | 9 | 1.50E-03 | 1.50E-03 | 1.10E-02 | 1.40E-02 | 5.59E-03 | | | Y |
| Cumene | 1 / 14 | 7 | 4.20E-03 | 4.20E-03 | 5.60E-03 | 6.80E-03 | 3.06E-03 | | | Y |
| p-Cymene | 1 / 14 | 7 | 3.90E-03 | 3.90E-03 | 5.60E-03 | 6.80E-03 | 3.04E-03 | | | Y |

mg/kg = milligrams per kilogram
UCL = upper confidence limit, UTL = upper tolerance limit
Statistical Distributions: N = Normal, L = Lognormal, NP = Nonparametric
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.

[b] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C8-3

### Selection of Chemicals of Potential Concern for Surface Soil[a]
### Parcel 231, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | | Statistical Distribution [b] | 95% UCL [c] (mg/kg) | Source-Term Concentration [d] (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Groundskeeper | | | | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? | | | |
| **Metals** | | | | | | | | | | | | |
| Copper | 2.63E+01 | 3.13E+02 | N | NA | NA | 4.08E+03 | N | NA | NA | | | |
| Lead | 9.26E+01 | 4.00E+02 | N | NA | NA | 8.80E+02 | N | NA | NA | | | |
| Selenium | 1.50E+00 | 3.91E+01 | N | NA | NA | 5.11E+02 | N | NA | NA | | | |
| **Chlorinated Pesticides** | | | | | | | | | | | | |
| 4,4'-DDE | 2.30E-02 | NA | NA | 1.79E+00 | N | NA | NA | 8.27E+00 | N | | | |
| 4,4'-DDT | 3.90E-02 | 3.83E+00 | N | 1.79E+00 | N | 5.02E+01 | N | 8.11E+00 | N | | | |
| Aldrin | 8.20E-04 | 2.32E-01 | N | 3.65E-02 | N | 3.03E+00 | N | 1.63E-01 | N | | | |
| delta-BHC | 2.70E-03 | 2.33E+00 | N | NA | NA | 3.05E+01 | N | NA | NA | | | |
| Endosulfan sulfate | 1.00E-03 | 4.66E+01 | N | NA | NA | 6.09E+02 | N | NA | NA | | | |
| Endrin ketone | 1.80E-03 | 2.32E-01 | N | NA | NA | 3.03E+00 | N | NA | NA | | | |
| **Semivolatile Organic Compounds** | | | | | | | | | | | | |
| Acenaphthylene | 1.90E-01 | 4.63E+02 | N | NA | NA | 6.07E+03 | N | NA | NA | | | |
| Anthracene | 1.60E-01 | 2.33E+03 | N | NA | NA | 3.04E+04 | N | NA | NA | | | |
| Benzo(a)anthracene | 1.20E-01 | NA | NA | 8.51E-01 | N | NA | NA | 3.85E+00 | N | | | |
| Benzo(a)pyrene | 1.80E-01 | NA | NA | 8.51E-02 | Y | NA | NA | 3.85E-01 | N | L | 2.10E-01 | 1.80E-01 |
| Benzo(b)fluoranthene | 2.00E-01 | NA | NA | 8.51E-01 | N | NA | NA | 3.85E+00 | N | | | |
| Benzo(ghi)perylene | 2.00E-01 | 2.32E+02 | N | NA | NA | 3.03E+03 | N | NA | NA | | | |
| Benzo(k)fluoranthene | 1.90E-01 | NA | NA | 8.51E+00 | N | NA | NA | 3.85E+01 | N | | | |
| Carbazole | 8.20E-02 | NA | NA | 3.11E+01 | N | NA | NA | 1.42E+02 | N | | | |
| Chrysene | 1.30E-01 | NA | NA | 8.61E+01 | N | NA | NA | 3.86E+02 | N | | | |
| Dibenz(a,h)anthracene | 6.10E-02 | NA | NA | 8.61E-02 | N | NA | NA | 3.86E-01 | N | | | |
| Di-n-butyl phthalate | 6.70E-02 | 7.80E+02 | N | NA | NA | 1.02E+04 | N | NA | NA | | | |
| Fluoranthene | 1.60E-01 | 3.09E+02 | N | NA | NA | 4.05E+03 | N | NA | NA | | | |
| Indeno(1,2,3-cd)pyrene | 1.50E-01 | NA | NA | 8.51E-01 | N | NA | NA | 3.85E+00 | N | | | |
| Phenanthrene | 5.50E-02 | 2.32E+03 | N | NA | NA | 3.03E+04 | N | NA | NA | | | |
| Pyrene | 1.70E-01 | 2.33E+02 | N | NA | NA | 3.05E+03 | N | NA | NA | | | |
| **Volatile Organic Compounds** | | | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 4.10E-03 | 3.88E+02 | N | NA | NA | 3.20E+03 | N | NA | NA | | | |
| 2-Butanone | 4.60E-03 | 4.66E+03 | N | NA | NA | 5.86E+04 | N | NA | NA | | | |
| Acetone | 4.90E-01 | 7.76E+02 | N | NA | NA | 1.02E+04 | N | NA | NA | | | |
| Bromomethane | 1.50E-03 | 1.09E+01 | N | NA | NA | 1.39E+02 | N | NA | NA | | | |
| Cumene | 4.20E-03 | 7.77E+02 | N | NA | NA | 9.98E+03 | N | NA | NA | | | |
| p-Cymene | 3.90E-03 | 1.55E+03 | N | NA | NA | 2.03E+04 | N | NA | NA | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
mg/kg = milligrams per kilogram
COPC = Chemical of potential concern
UCL = Upper confidence limit
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.
[b] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[c] 95% UCL calculated only for COPC with at least 5 samples.
[d] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C8-4

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Surface Soil[a]
## Parcel 231, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/kg) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Semivolatile Organic Compounds** | | | |
| Benzo(a)pyrene | 1.80E-01 | NA | 2.12E-06 |
| **Total HI / ILCR** | | **NA** | **2.12E-06** |

[a] Surface soil is defined as soil from 0 to 1 foot below ground surface.
COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C8-5

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 231, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-231-SEP01 | KT2001 | 8-Feb-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs, Nitro |
| PPMP-231-SW/SD01 | KT2004 | 10-Mar-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs, Nitro |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
OP Pest - Organophosphate Pesticides
Nitro - Nitroaromatics
PCBs - Polychlorinated biphenyls

## Table C8-6

## Selection of Site-Related Chemicals for Surface Water
## Parcel 231, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 2 / 2 | 100 | 3.44E-01 | 4.26E-01 | 2.00E-01 | 2.00E-01 | 5.26E+00 | 1.70E+01 | N (a) |
| Barium | 2 / 2 | 100 | 7.00E-03 | 8.52E-02 | 2.00E-01 | 2.00E-01 | 7.54E-02 | 1.13E-01 | N (b) |
| Calcium | 2 / 2 | 100 | 2.47E-01 | 6.25E+01 | 5.00E+00 | 5.00E+00 | 2.52E+01 | 6.41E+01 | N (d) |
| Iron | 2 / 2 | 100 | 2.63E-01 | 7.12E-01 | 1.00E-01 | 1.00E-01 | 1.96E+01 | 4.12E+01 | N (a) |
| Lead | 1 / 2 | 50 | 3.20E-03 | 3.20E-03 | 3.00E-03 | 3.00E-03 | 8.67E-03 | 4.73E-02 | N (a) |
| Magnesium | 2 / 2 | 100 | 1.84E-01 | 1.74E+01 | 5.00E+00 | 5.00E+00 | 1.10E+01 | 2.44E+01 | N (d) |
| Manganese | 2 / 2 | 100 | 2.77E-02 | 4.21E-02 | 1.50E-02 | 1.50E-02 | 5.65E-01 | 1.83E+00 | N (a) |
| Potassium | 1 / 2 | 50 | 1.09E+00 | 1.09E+00 | 5.00E+00 | 5.00E+00 | 2.56E+00 | 4.25E+00 | N (a) |
| **Volatile Organic Compounds** | | | | | | | | | |
| Acetone | 1 / 1 | 100 | 2.50E-03 | 2.50E-03 | 1.00E-02 | 1.00E-02 | | | Y |

mg/L = milligrams per liter
UTL = upper tolerance limit
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
[a] Background criterion for inorganic constituents is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C8-7

## Selection of Chemicals of Potential Concern for Surface Water
## Parcel 231, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | |
|---|---|---|---|---|---|
| | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? |
| **Volatile Organic Compounds** | | | | | |
| Acetone | 2.50E-03 | 1.57E+00 | N | NA | NA |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
mg/L = milligrams per liter
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

## Table C8-8

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 231, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-231-SW/SD01 | KT1001 | 10-Mar-99 | 0 - 1 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs, PCBs, Nitro |

SVOCs - Semivolatile organic compounds
VOCs - Volatile organic compounds
CL Herb - Chlorinated Herbicides
CL Pest - Chlorinated Pesticides
OP Pest - Organophosphate Pesticides
PCBs - Polychlorinated biphenyls
Nitro - Nitroaromatics

## Table C8-9

## Selection of Site-Related Chemicals for Sediment[a]
## Parcel 231, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 1 / 1 | 100 | 3.81E+03 | 3.81E+03 | 2.48E+01 | 2.48E+01 | 8.59E+03 | 1.43E+04 | N (a) |
| Arsenic | 1 / 1 | 100 | 3.70E+00 | 3.70E+00 | 1.20E+00 | 1.20E+00 | 1.13E+01 | 2.01E+01 | N (a) |
| Barium | 1 / 1 | 100 | 8.40E+00 | 8.40E+00 | 2.48E+01 | 2.48E+01 | 9.89E+01 | 1.91E+02 | N (a) |
| Beryllium | 1 / 1 | 100 | 1.30E-01 | 1.30E-01 | 6.20E-01 | 6.20E-01 | 9.70E-01 | 1.24E+00 | N (a) |
| Chromium | 1 / 1 | 100 | 1.20E+01 | 1.20E+01 | 1.20E+00 | 1.20E+00 | 3.12E+01 | 6.33E+01 | N (a) |
| Cobalt | 1 / 1 | 100 | 1.30E+00 | 1.30E+00 | 6.20E+00 | 6.20E+00 | 1.10E+01 | 2.19E+01 | N (a) |
| Copper | 1 / 1 | 100 | 1.70E+00 | 1.70E+00 | 3.10E+00 | 3.10E+00 | 1.71E+01 | 3.68E+01 | N (a) |
| Iron | 1 / 1 | 100 | 1.07E+04 | 1.07E+04 | 1.24E+01 | 1.24E+01 | 3.53E+04 | 5.19E+04 | N (a) |
| Lead | 1 / 1 | 100 | 4.20E+00 | 4.20E+00 | 3.70E-01 | 3.70E-01 | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 1 / 1 | 100 | 4.47E+01 | 4.47E+01 | 6.20E+02 | 6.20E+02 | 9.06E+02 | 2.20E+03 | N (a) |
| Manganese | 1 / 1 | 100 | 1.51E+02 | 1.51E+02 | 1.90E+00 | 1.90E+00 | 7.12E+02 | 2.05E+03 | N (a) |
| Selenium | 1 / 1 | 100 | 5.10E-01 | 5.10E-01 | 6.20E-01 | 6.20E-01 | 7.20E-01 | 1.88E+00 | N (a) |
| Vanadium | 1 / 1 | 100 | 2.23E+01 | 2.23E+01 | 6.20E+00 | 6.20E+00 | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 1 / 1 | 100 | 2.60E+00 | 2.60E+00 | 2.50E+00 | 2.50E+00 | 5.27E+01 | 1.11E+02 | N (a) |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/kg = milligrams per kilogram
UTL = upper tolerance limit
[a] Sediment is defined as soil from 0 to 1 foot below ground surface.
[b] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[c] 95% Upper Tolerance Limit based on statistical distribution of background metal data.
[d] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C8-10

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 231, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-231-GP01 | KT3001 | 7-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-231-GP02 | KT3002 | 8-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-231-GP03 | KT3005 | 7-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-231-GP11 | KT3006 | 7-Apr-1999 | CL Herb, CL Pest, Metals, Nitroaromatics, OP Pest, PCBs, SVOCs, VOCs |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C8-11

## Selection of Site-Related Chemicals for Groundwater
## Parcel 231, Fort McClellan, Alabama

| Chemical | Detection Frequency | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Aluminum | 2 / 2 | 4.11E-01 | 2.96E+01 | 2.00E-01 | 2.00E-01 | 1.50E+01 | 2.34E+00 | 9.60E+00 | Y |
| Arsenic | 1 / 4 | 3.03E-02 | 3.03E-02 | 1.00E-02 | 1.00E-02 | 1.13E-02 | 1.78E-02 | 2.22E-01 | N (b) |
| Barium | 4 / 4 | 9.30E-03 | 1.15E-01 | 2.00E-01 | 2.00E-01 | 5.06E-02 | 1.27E-01 | 4.72E-01 | N (a) |
| Beryllium | 1 / 4 | 1.80E-03 | 1.80E-03 | 5.00E-03 | 5.00E-03 | 2.33E-03 | 1.25E-03 | 2.37E-03 | N (b) |
| Calcium | 2 / 2 | 1.22E+00 | 2.34E+00 | 5.00E+00 | 5.00E+00 | 1.78E+00 | 5.65E+01 | 4.52E+02 | N (a) |
| Chromium | 1 / 4 | 5.80E-02 | 5.80E-02 | 1.00E-02 | 1.00E-02 | 1.83E-02 | | | Y |
| Cobalt | 1 / 3 | 3.06E-02 | 3.06E-02 | 5.00E-02 | 5.00E-02 | 2.69E-02 | 2.34E-02 | 2.52E-02 | Y |
| Copper | 1 / 4 | 3.41E-02 | 3.41E-02 | 2.50E-02 | 2.50E-02 | 1.79E-02 | 2.55E-02 | 2.35E-01 | N (b) |
| Iron | 2 / 2 | 3.48E-01 | 7.48E+01 | 1.00E-01 | 1.00E-01 | 3.76E+01 | 7.04E+00 | 2.58E+01 | Y |
| Lead | 1 / 4 | 1.26E-01 | 1.26E-01 | 3.00E-03 | 3.00E-03 | 3.26E-02 | 8.00E-03 | 2.58E-02 | Y |
| Magnesium | 2 / 2 | 4.29E-01 | 2.49E+00 | 5.00E+00 | 5.00E+00 | 1.46E+00 | 2.13E+01 | 1.49E+02 | N (a) |
| Manganese | 4 / 4 | 4.92E-02 | 1.82E+00 | 1.50E-02 | 1.50E-02 | 5.49E-01 | 5.81E-01 | 4.13E+00 | N (b) |
| Nickel | 1 / 4 | 4.44E-02 | 4.44E-02 | 4.00E-02 | 4.00E-02 | 2.61E-02 | | | Y |
| Potassium | 1 / 4 | 5.24E+00 | 5.24E+00 | 5.00E+00 | 5.00E+00 | 3.19E+00 | 7.20E+00 | 6.85E+01 | N (a) |
| Vanadium | 1 / 4 | 1.20E-01 | 1.20E-01 | 5.00E-02 | 5.00E-02 | 4.88E-02 | 1.70E-02 | 1.14E-02 | Y |
| Zinc | 1 / 4 | 1.86E-01 | 1.86E-01 | 2.00E-02 | 2.00E-02 | 5.40E-02 | 2.20E-01 | 1.52E+00 | N (a) |
| **Volatile Organic Compounds** | | | | | | | | | |
| Carbon disulfide | 1 / 4 | 1.40E-04 | 1.40E-04 | 1.00E-03 | 1.00E-03 | 4.10E-04 | | | Y |
| Chloroform | 1 / 4 | 2.30E-04 | 2.30E-04 | 1.00E-03 | 1.00E-03 | 4.33E-04 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C8-12

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 231, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | |
| Aluminum | 2.96E+01 | 1.56E+00 | Y | NA | NA | NA | NA | 2.96E+01 |
| Chromium | 5.80E-02 | 4.69E-03 | Y | NA | NA | NA | NA | 5.80E-02 |
| Cobalt | 3.06E-02 | 9.39E-02 | N | NA | NA | | | |
| Iron | 7.48E+01 | 4.69E-01 | Y | NA | NA | NA | NA | 7.48E+01 |
| Lead | 1.26E-01 | 1.50E-02 | Y | NA | NA | NA | NA | 1.26E-01 |
| Nickel | 4.44E-02 | 3.13E-02 | Y | NA | NA | NA | NA | 4.44E-02 |
| Vanadium | 1.20E-01 | 1.10E-02 | Y | NA | NA | NA | NA | 1.20E-01 |
| **Volatile Organic Compounds** | | | | | | | | |
| Carbon disulfide | 1.40E-04 | 1.51E-01 | N | NA | NA | | | |
| Chloroform | 2.30E-04 | 3.11E-04 | N | 1.15E-03 | N | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C8-13

## Cancer Risk and Noncancer Hazard Estimates for the Resident Exposed to Groundwater Parcel 231, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Aluminum | 2.96E+01 | 1.89E+00 | NA |
| Chromium | 5.80E-02 | 1.24E+00 | NA |
| Iron | 7.48E+01 | 1.59E+01 | NA |
| Lead* | 1.26E-01 | NA | NA |
| Nickel | 4.44E-02 | 1.42E-01 | NA |
| Vanadium | 1.20E-01 | 1.10E+00 | NA |
| **Total HI / ILCR** | | **2.03E+01** | **NA** |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/L = milligrams per liter
* = Lead is evaluated quantitatively in the text.

## Table C8-14

## Separation of Noncancer Hazard by Target Organ for Resident Parcel 231, Fort McClellan, Alabama

| COPC | Target Organ Hazard* NS | CNS | RBW | RT | ND |
|---|---|---|---|---|---|
| ***For Groundwater:*** | | | | | |
| **Metals** | | | | | |
| Aluminum | 1.89E+00 | 1.89E+00 | | | |
| Chromium | | | | 1.24E+00 | 1.24E+00 |
| Nickel | | | 1.42E-01 | | |
| Vanadium | | | | 1.10E+00 | 1.10E+00 |
| **Resident HI by Target Organ:** | **1.89E+00** | **1.89E+00** | **1.42E-01** | **2.33E+00** | **2.33E+00** |

COPC = Chemical of potential concern
NS = Neurological System
CNS = Central Nervous System
RBW = Reduced Body Weight
RT = Respiratory Tract
ND = No data
* See Toxicological Profiles for data regarding selection of target organs.

## Table C8-15

## Remedial Goal Options Based on Noncancer for Resident Groundwater
## Parcel 231, Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/L) | MCL[a] (mg/L) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/L) Based on an HI of: 0.1 | 1 | 3 |
|---|---|---|---|---|---|---|
| **Metals** | | | | | | |
| Aluminum | 2.96E+01 | NA | 1.89E+00 | 1.56E+00 | 1.56E+01 | 4.69E+01 |
| Chromium | 5.80E-02 | 1.00E-01 | 1.24E+00 | 4.69E-03 | 4.69E-02 | 1.41E-01 |
| Vanadium | 1.20E-01 | NA | 1.10E+00 | 1.10E-02 | 1.10E-01 | 3.29E-01 |
| Lead | 1.26E-01 | 1.50E-02 | NA | Clean-up Level: 0.015 mg/L* | | |

COC = Chemical of concern.
HI = Hazard index
MCL = Maximum contaminant level.
ND = No data
a = US Environmental Protection Agency, *National Primary Drinking Water Regulations*, March 2001, online.
* Based on EPA drinking water action level

## Table C8-16

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcel 231, Fort McClellan, Alabama

| Medium | Resident | | Groundskeeper | |
|---|---|---|---|---|
| | HI | ILCR | HI | ILCR |
| Surface Soil | NA | 2.12E-06 | NA | NA |
| Surface Water | NA | NA | NA | NA |
| Sediment | NA | NA | NA | NA |
| Groundwater | 2.03E+01 | NA | NA | NA |
| **Total HI / ILCR** | **2.03E+01** | **2.12E-06** | **NA** | **NA** |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C9-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 233, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-233-DEP01 | KZ0015 | 2-Jun-2000 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP01 | KZ0001 | 2-Jun-2000 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP02 | KZ0005 | 2-Jun-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP03 | KZ0007 | 2-Jun-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP04 | KZ0009 | 2-Jun-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP05 | KZ0011 | 2-Jun-2000 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP06 | KZ0013 | 2-Jun-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C9-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 233, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 7 / 7 | 100 | 7.61E+03 | 1.23E+04 | 2.29E+01 | 2.58E+01 | 1.01E+04 | 1.63E+04 | 2.14E+04 | N (a) |
| Arsenic | 7 / 7 | 100 | 4.30E+00 | 9.50E+00 | 1.10E+00 | 1.30E+00 | 7.40E+00 | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 7 / 7 | 100 | 5.43E+01 | 1.82E+03 | 2.29E+01 | 1.15E+02 | 3.49E+02 | 1.24E+02 | 1.94E+02 | Y |
| Beryllium | 7 / 7 | 100 | 5.40E-01 | 1.70E+00 | 5.70E-01 | 6.50E-01 | 1.19E+00 | 8.00E-01 | 8.68E-01 | Y |
| Calcium | 7 / 7 | 100 | 5.69E+01 | 8.16E+02 | 5.73E+02 | 6.45E+02 | 3.14E+02 | 1.72E+03 | 3.54E+03 | N (a) |
| Chromium | 7 / 7 | 100 | 1.10E+01 | 2.15E+01 | 1.10E+00 | 1.30E+00 | 1.66E+01 | 3.70E+01 | 6.44E+01 | N (a) |
| Cobalt | 7 / 7 | 100 | 7.90E+00 | 1.20E+02 | 5.70E+00 | 6.50E+00 | 3.27E+01 | 1.52E+01 | 3.25E+01 | Y |
| Copper | 7 / 7 | 100 | 6.80E+00 | 2.40E+01 | 2.90E+00 | 3.20E+00 | 1.51E+01 | 1.27E+01 | 2.25E+01 | Y |
| Iron | 7 / 7 | 100 | 1.31E+04 | 3.21E+04 | 1.15E+01 | 1.29E+01 | 2.50E+04 | 3.42E+04 | 5.54E+04 | N (a) |
| Lead | 7 / 7 | 100 | 1.13E+01 | 4.85E+01 | 3.40E-01 | 3.90E-01 | 2.04E+01 | 4.01E+01 | 6.38E+01 | N (b) |
| Magnesium | 7 / 7 | 100 | 2.13E+02 | 5.25E+02 | 5.73E+02 | 6.45E+02 | 3.61E+02 | 1.03E+03 | 9.60E+03 | N (a) |
| Manganese | 7 / 7 | 100 | 5.59E+02 | 9.07E+03 | 1.70E+00 | 8.70E+00 | 3.02E+03 | 1.58E+03 | 4.66E+03 | Y |
| Mercury | 7 / 7 | 100 | 3.00E-02 | 8.50E-02 | 3.80E-02 | 4.30E-02 | 5.29E-02 | 8.00E-02 | 3.22E-01 | N (b) |
| Nickel | 7 / 7 | 100 | 6.80E+00 | 2.11E+01 | 4.60E+00 | 5.20E+00 | 1.49E+01 | 1.03E+01 | 2.00E+01 | N (b) |
| Potassium | 7 / 7 | 100 | 2.51E+02 | 7.10E+02 | 5.73E+02 | 6.45E+02 | 4.72E+02 | 8.00E+02 | 6.01E+03 | N (a) |
| Silver | 1 / 7 | 14 | 2.40E-01 | 2.40E-01 | 1.10E+00 | 1.30E+00 | 5.56E-01 | 3.60E-01 | 1.13E+00 | N (a) |
| Thallium | 1 / 6 | 17 | 6.80E-01 | 6.80E-01 | 1.10E+00 | 1.30E+00 | 6.30E-01 | 3.43E+00 | 4.53E-01 | N (a) |
| Vanadium | 7 / 7 | 100 | 1.70E+01 | 3.57E+01 | 5.70E+00 | 6.50E+00 | 2.63E+01 | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 7 / 7 | 100 | 1.84E+01 | 4.46E+01 | 2.30E+00 | 2.60E+00 | 3.39E+01 | 4.06E+01 | 7.37E+01 | N (b) |
| **Chlorinated Pesticides** | | | | | | | | | | |
| Endosulfan II | 1 / 7 | 14 | 6.70E-04 | 6.70E-04 | 1.90E-03 | 6.00E-03 | 1.27E-03 | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Benzo(ghi)perylene | 1 / 7 | 14 | 6.50E-02 | 6.50E-02 | 3.80E-01 | 4.30E-01 | 1.82E-01 | | | Y |
| bis(2-Ethylhexyl)phthalate | 1 / 3 | 33 | 4.30E-02 | 4.30E-02 | 3.80E-01 | 4.00E-01 | 1.46E-01 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| Naphthalene | 1 / 7 | 14 | 8.80E-04 | 8.80E-04 | 5.70E-03 | 6.50E-03 | 2.75E-03 | | | Y |
| 1,1,1-Trichloroethane | 4 / 7 | 57 | 6.90E-04 | 1.10E-03 | 5.70E-03 | 6.50E-03 | 1.87E-03 | | | Y |
| Acetone | 5 / 6 | 83 | 1.30E-02 | 2.90E+00 | 2.30E-02 | 1.20E+00 | 7.57E-01 | | | Y |
| Cumene | 3 / 7 | 43 | 8.40E-04 | 5.80E-03 | 5.70E-03 | 6.50E-03 | 3.33E-03 | | | Y |
| p-Cymene | 3 / 7 | 43 | 1.30E-03 | 5.20E-03 | 5.70E-03 | 6.50E-03 | 2.92E-03 | | | Y |
| Styrene | 1 / 7 | 14 | 1.10E-03 | 1.10E-03 | 5.70E-03 | 6.50E-03 | 2.74E-03 | | | Y |
| Trichlorofluoromethane | 1 / 7 | 14 | 3.00E-03 | 3.00E-03 | 1.10E-02 | 1.30E-02 | 5.64E-03 | | | Y |

mg/kg = milligrams per kilogram

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Surface soil is defined as soil from 0 to 2 feet below ground surface.

[b] Background screening criterion for metals is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C9-3

## Selection of Chemicals of Potential Concern for Surface Soil[a]
## Parcel 233, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Barium | 1.82E+03 | 4.41E+04 | N | NA | NA | 4.41E+04 | N | NA | NA |
| Beryllium | 1.70E+00 | 4.08E+02 | N | NA | NA | 4.08E+02 | N | NA | NA |
| Cobalt | 1.20E+02 | 3.75E+04 | N | NA | NA | 3.75E+04 | N | NA | NA |
| Copper | 2.40E+01 | 2.52E+04 | N | NA | NA | 2.52E+04 | N | NA | NA |
| Manganese | 9.07E+03 | 2.85E+04 | N | NA | NA | 2.85E+04 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| Endosulfan II | 6.70E-04 | 3.69E+03 | N | NA | NA | 3.69E+03 | N | NA | NA |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Benzo(g,h,i)perylene | 6.50E-02 | 1.82E+04 | N | NA | NA | 1.82E+04 | N | NA | NA |
| bis(2-Ethylhexyl)phthalate | 4.30E-02 | 1.24E+04 | N | 3.11E+03 | N | 1.24E+04 | N | 3.11E+03 | N |
| **Volatile Organic Compounds** | | | | | | | | | |
| Naphthalene | 8.80E-04 | 1.24E+04 | N | NA | NA | 1.24E+04 | N | NA | NA |
| 1,1,1-Trichloroethane | 1.10E-03 | 1.24E+05 | N | NA | NA | 1.24E+05 | N | NA | NA |
| Acetone | 2.90E+00 | 6.16E+04 | N | NA | NA | 6.16E+04 | N | NA | NA |
| Cumene | 5.80E-03 | 6.17E+04 | N | NA | NA | 6.17E+04 | N | NA | NA |
| p-Cymene | 5.20E-03 | 1.23E+05 | N | NA | NA | 1.23E+05 | N | NA | NA |
| Styrene | 1.10E-03 | 1.24E+05 | N | NA | NA | 1.24E+05 | N | NA | NA |
| Trichlorofluoromethane | 3.00E-03 | 1.85E+05 | N | NA | NA | 1.85E+05 | N | NA | NA |

mg/kg = milligrams per kilogram
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as soil from 0 to 2 feet below ground surface.

## Table C9-4

## Total Soil Samples Used in Streamlined Risk Assessment
## Parcel 233, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| PPMP-233-GP01 | KZ0001 | 8-Feb-2000 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP01 | KZ0004 | 8-Feb-2000 | 10 - 12 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP02 | KZ0005 | 21-Feb-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP02 | KZ0006 | 21-Feb-2000 | 10 - 12 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP03 | KZ0007 | 21-Feb-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP03 | KZ0008 | 21-Feb-2000 | 10 - 12 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP04 | KZ0009 | 22-Feb-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP04 | KZ0010 | 22-Feb-2000 | 10 - 12 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP05 | KZ0011 | 8-Feb-2000 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP05 | KZ0012 | 8-Feb-2000 | 10 - 12 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs, Nitro |
| PPMP-233-GP06 | KZ0013 | 23-Feb-2000 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-GP06 | KZ0014 | 24-Feb-2000 | 8 - 10 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |
| PPMP-233-DEP01 | KZ0015 | 2-Jun-2000 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
Nitro = Nitroaromatics
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C9-5

### Selection of Site-Related Chemicals for Total Soil[a]
### Parcel 233, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 13 / 13 | 100 | 3.33E+03 | 1.23E+04 | 2.29E+01 | 2.58E+01 | 8.38E+03 | 1.50E+04 | 1.80E+04 | N (a) |
| Arsenic | 13 / 13 | 100 | 4.30E+00 | 1.34E+01 | 1.10E+00 | 1.30E+00 | 8.22E+00 | 1.60E+01 | 3.24E+01 | N (a) |
| Barium | 13 / 13 | 100 | 2.07E+01 | 1.82E+03 | 2.29E+01 | 1.15E+02 | 2.84E+02 | 1.76E+02 | 2.42E+02 | Y |
| Beryllium | 12 / 12 | 100 | 5.40E-01 | 4.60E+00 | 5.70E-01 | 6.50E-01 | 1.65E+00 | 8.31E-01 | 1.50E+00 | Y |
| Cadmium | 1 / 13 | 8 | 1.20E+00 | 1.20E+00 | 5.70E-01 | 6.50E-01 | 3.72E-01 | 2.51E-01 | 6.83E-01 | Y |
| Calcium | 8 / 8 | 100 | 5.69E+01 | 8.16E+02 | 5.73E+02 | 6.45E+02 | 2.83E+02 | 1.20E+03 | 2.41E+03 | N (a) |
| Chromium | 13 / 13 | 100 | 7.10E+00 | 2.50E+01 | 1.10E+00 | 1.30E+00 | 1.59E+01 | 3.76E+01 | 5.63E+01 | N (a) |
| Cobalt | 13 / 13 | 100 | 5.50E+00 | 1.20E+02 | 5.70E+00 | 6.50E+00 | 3.36E+01 | 1.63E+01 | 3.63E+01 | Y |
| Copper | 13 / 13 | 100 | 6.80E+00 | 3.22E+01 | 2.90E+00 | 3.20E+00 | 2.02E+01 | 1.59E+01 | 2.59E+01 | Y |
| Iron | 13 / 13 | 100 | 1.31E+04 | 7.98E+04 | 1.15E+01 | 1.18E+02 | 3.32E+04 | 3.92E+04 | 5.63E+04 | Y |
| Lead | 13 / 13 | 100 | 1.11E+01 | 4.85E+01 | 3.40E-01 | 3.90E-01 | 1.84E+01 | 3.93E+01 | 6.05E+01 | N (b) |
| Magnesium | 13 / 13 | 100 | 1.04E+02 | 5.25E+02 | 5.73E+02 | 6.45E+02 | 2.84E+02 | 9.06E+02 | 5.54E+03 | N (a) |
| Manganese | 13 / 13 | 100 | 2.65E+02 | 2.02E+04 | 1.70E+00 | 1.77E+01 | 3.40E+03 | 1.47E+03 | 4.12E+03 | N (e) |
| Mercury | 13 / 13 | 100 | 2.40E-02 | 8.80E-02 | 3.80E-02 | 4.30E-02 | 5.12E-02 | 7.04E-02 | 1.71E-01 | N (b) |
| Nickel | 13 / 13 | 100 | 6.80E+00 | 8.35E+01 | 4.60E+00 | 5.20E+00 | 2.32E+01 | 1.16E+01 | 2.07E+01 | Y |
| Potassium | 13 / 13 | 100 | 2.51E+02 | 1.76E+03 | 5.73E+02 | 6.45E+02 | 6.92E+02 | 7.57E+02 | 5.78E+03 | N (b) |
| Selenium | 1 / 13 | 8 | 5.00E-01 | 5.00E-01 | 5.70E-01 | 6.50E-01 | 3.18E-01 | 4.80E-01 | 5.57E-01 | N (b) |
| Silver | 2 / 13 | 15 | 2.40E-01 | 3.90E-01 | 1.10E+00 | 1.30E+00 | 5.64E-01 | 3.03E-01 | 8.51E-01 | N (b) |
| Thallium | 3 / 9 | 33 | 6.80E-01 | 8.30E-01 | 1.10E+00 | 1.30E+00 | 6.64E-01 | 2.45E+00 | 6.62E+00 | N (a) |
| Vanadium | 13 / 13 | 100 | 1.37E+01 | 4.40E+01 | 5.70E+00 | 6.50E+00 | 2.57E+01 | 6.17E+01 | 9.05E+01 | N (a) |
| Zinc | 13 / 13 | 100 | 1.84E+01 | 1.48E+02 | 2.30E+00 | 2.60E+00 | 6.22E+01 | 3.79E+01 | 7.13E+01 | Y |
| **Chlorinated Pesticides** | | | | | | | | | | |
| Endosulfan II | 1 / 13 | 8 | 6.70E-04 | 6.70E-04 | 1.90E-03 | 6.00E-03 | 1.16E-03 | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| Benzo(ghi)perylene | 1 / 13 | 8 | 6.50E-02 | 6.50E-02 | 3.80E-01 | 4.30E-01 | 1.90E-01 | | | Y |
| bis(2-Ethylhexyl)phthalate | 1 / 5 | 20 | 4.30E-02 | 4.30E-02 | 3.80E-01 | 4.00E-01 | 1.67E-01 | | | Y |
| Di-n-octyl phthalate | 1 / 13 | 8 | 1.90E-01 | 1.90E-01 | 3.80E-01 | 4.30E-01 | 2.00E-01 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 1,1,1-Trichloroethane | 8 / 13 | 62 | 6.90E-04 | 1.40E-03 | 5.70E-03 | 6.50E-03 | 1.80E-03 | | | Y |
| Acetone | 6 / 9 | 67 | 1.30E-02 | 2.90E+00 | 2.30E-02 | 1.20E+00 | 5.09E-01 | | | Y |
| Cumene | 3 / 13 | 23 | 8.40E-04 | 5.80E-03 | 5.70E-03 | 6.50E-03 | 3.19E-03 | | | Y |
| Naphthalene | 1 / 13 | 8 | 8.80E-04 | 8.80E-04 | 5.70E-03 | 6.50E-03 | 2.87E-03 | | | Y |
| p-Cymene | 3 / 13 | 23 | 1.30E-03 | 5.20E-03 | 5.70E-03 | 6.50E-03 | 2.97E-03 | | | Y |
| Styrene | 1 / 13 | 8 | 1.10E-03 | 1.10E-03 | 5.70E-03 | 6.50E-03 | 2.87E-03 | | | Y |
| Trichlorofluoromethane | 2 / 13 | 15 | 3.00E-03 | 3.00E-03 | 1.10E-02 | 1.30E-02 | 5.62E-03 | | | Y |

mg/kg = milligrams per kilogram
UCL = upper confidence limit
UTL = upper tolerance limit
N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Total Soil is defined as soil from 0 to 12 feet below ground surface.

[b] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C9-6

## Selection of Chemicals of Potential Concern for Total Soil[a]
## Parcel 233, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) Highway Worker | | | |
|---|---|---|---|---|---|
| | | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | |
| Barium | 1.82E+03 | 5.68E+03 | N | NA | NA |
| Beryllium | 4.60E+00 | 1.60E+02 | N | 4.80E+03 | N |
| Cadmium | 1.20E+00 | 4.03E+02 | N | 6.39E+03 | N |
| Cobalt | 1.20E+02 | 2.42E+02 | N | NA | NA |
| Copper | 3.22E+01 | 6.74E+04 | N | NA | NA |
| Iron | 7.98E+04 | 5.08E+05 | N | NA | NA |
| Lead | 4.85E+01 | 8.80E+02 | N | NA | NA |
| Mercury | 8.80E-02 | 4.16E+02 | N | NA | NA |
| Selenium | 5.00E-01 | 8.45E+03 | N | NA | NA |
| Zinc | 1.48E+02 | 4.98E+05 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | |
| Endosulfan II | 6.70E-04 | 9.47E+03 | N | NA | NA |
| **Semivolatile Organic Compounds** | | | | | |
| Benzo(ghi)perylene | 6.50E-02 | 4.54E+04 | N | NA | NA |
| bis(2-Ethylhexyl)phthalate | 4.30E-02 | 3.24E+04 | N | 1.06E+05 | N |
| Di-n-octyl phthalate | 1.90E-01 | 3.24E+04 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | |
| 1,1,1-Trichloroethane | 1.40E-03 | 3.12E+05 | N | NA | NA |
| Acetone | 2.90E+00 | 1.58E+05 | N | NA | NA |
| Cumene | 5.80E-03 | 1.11E+05 | N | NA | NA |
| Naphthalene | 8.80E-04 | 1.71E+04 | N | NA | NA |
| p-Cymene | 5.20E-03 | 3.18E+05 | N | NA | NA |
| Styrene | 1.10E-03 | 3.12E+05 | N | NA | NA |
| Trichlorofluoromethane | 3.00E-03 | 4.49E+05 | N | NA | NA |

mg/kg = milligrams per kilogram

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).

COPC = Chemical of potential concern.

UCL = Upper confidence limit.

N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

[a] Total Soil is defined as soil from 0 to 12 feet below ground surface.

## Table C9-7

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 233
## Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| PPMP-233-GP04 | KZ3004 | 14-Jul-2000 | CL Herb, CL Pest, Metals, OP Pest, PCBs, SVOCs, VOCs |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
PCB = Polychlorinated biphenyls
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C9-8

## Selection of Site-Related Chemicals for Groundwater
## Parcel 233
## Fort McClellan, Alabama

| Chemical | Detection Frequency | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Barium | 1 / 1 | 1.30E-02 | 1.30E-02 | 2.00E-01 | 2.00E-01 | 1.30E-02 | 1.27E-01 | 4.72E-01 | N (a) |
| Calcium | 1 / 1 | 7.16E-01 | 7.16E-01 | 5.00E+00 | 5.00E+00 | 7.16E-01 | 5.65E+01 | 4.52E+02 | N (a) |
| Chromium | 1 / 1 | 1.30E-01 | 1.30E-01 | 1.00E-02 | 1.00E-02 | 1.30E-01 | | | Y |
| Cobalt | 1 / 1 | 1.07E-02 | 1.07E-02 | 5.00E-02 | 5.00E-02 | 1.07E-02 | 2.34E-02 | 2.52E-02 | N (a) |
| Iron | 1 / 1 | 2.09E+00 | 2.09E+00 | 1.00E-01 | 1.00E-01 | 2.09E+00 | 7.04E+00 | 2.58E+01 | N (a) |
| Manganese | 1 / 1 | 1.91E-01 | 1.91E-01 | 1.50E-02 | 1.50E-02 | 1.91E-01 | 5.81E-01 | 4.13E+00 | N (a) |
| Nickel | 1 / 1 | 7.04E-02 | 7.04E-02 | 4.00E-02 | 4.00E-02 | 7.04E-02 | | | Y |
| Potassium | 1 / 1 | 1.22E+00 | 1.22E+00 | 5.00E+00 | 5.00E+00 | 1.22E+00 | 7.20E+00 | 6.85E+01 | N (a) |
| Sodium | 1 / 1 | 1.75E+00 | 1.75E+00 | 5.00E+00 | 5.00E+00 | 1.75E+00 | 1.48E+01 | 4.90E+01 | N (a) |
| Zinc | 1 / 1 | 1.52E-02 | 1.52E-02 | 2.00E-02 | 2.00E-02 | 1.52E-02 | 2.20E-01 | 1.52E+00 | N (a) |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDD | 1 / 1 | 7.40E-05 | 7.40E-05 | 5.00E-05 | 5.00E-05 | 7.40E-05 | | | Y |
| Aldrin | 1 / 1 | 3.40E-05 | 3.40E-05 | 5.00E-05 | 5.00E-05 | 3.40E-05 | | | Y |
| delta-BHC | 1 / 1 | 3.30E-05 | 3.30E-05 | 5.00E-05 | 5.00E-05 | 3.30E-05 | | | Y |
| Endosulfan II | 1 / 1 | 1.60E-05 | 1.60E-05 | 5.00E-05 | 5.00E-05 | 1.60E-05 | | | Y |

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.
mg/L = milligram per liter
[a] Background criterion for inorganic constituents is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).
[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.
[c] Rationale for exclusion of a chemical as site-related:
N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C9-9

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 233
## Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | |
| Chromium | 1.30E-01 | 4.69E-03 | Y | NA | NA | NA | NA | 1.30E-01 |
| Nickel | 7.04E-02 | 3.13E-02 | Y | NA | NA | NA | NA | 7.04E-02 |
| **Chlorinated Pesticides** | | | | | | | | |
| 4,4'-DDD | 7.40E-05 | NA | NA | 1.83E-04 | N | | | |
| Aldrin | 3.40E-05 | 4.67E-05 | N | 3.92E-06 | Y | NA | NA | 3.40E-05 |
| delta-BHC | 3.30E-05 | 4.49E-04 | N | NA | NA | | | |
| Endosulfan II | 1.60E-05 | 9.35E-03 | N | NA | NA | | | |

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
mg/L = milligram per liter
UCL = Upper confidence limit.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C9-10

## Cancer Risk and Noncancer Hazard Estimates for the Resident Exposed to Groundwater
## Parcel 233
## Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Chromium | 1.30E-01 | 2.77E+00 | NA |
| Nickel | 7.04E-02 | 2.25E-01 | NA |
| **Chlorinated Pesticides** | | | |
| Aldrin | 3.40E-05 | NA | 8.68E-06 |
| **Total HI / ILCR** | | **3.00E+00** | **8.68E-06** |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/L = milligram per liter

## Table C9-11

## Separation of Noncancer Hazard by Target Organ
## Parcel 233
## Fort McClellan, Alabama

| | Target Organ Hazard* | | |
|---|---|---|---|
| COPC | Lung | Reduced Body Weight | ND |
| ***For Groundwater:*** | | | |
| **Metals** | | | |
| Chromium | 2.77E+00 | | 2.77E+00 |
| Nickel | 2.25E-01 | 2.25E-01 | |
| **Resident HI by Target Organ:** | **3.00E+00** | **2.25E-01** | **2.77E+00** |

COPC = Chemical of potential concern
HI = Hazard Index
ND = No data
* See Toxicological Profiles for data regarding selection of target organs.

## Table C9-12

## Remedial Goal Options Based on Noncancer for the Resident
## Groundwater
## Parcel 233
## Fort McClellan, Alabama

| COC | Source-Term Concentration (mg/L) | MCL[a] (mg/L) | HI (all pathways) for COC | Noncancer Remedial Goal Options (mg/L) Based on an HI of: 0.1 | 1 | 3 |
|---|---|---|---|---|---|---|
| **Metals** | | | | | | |
| Chromium | 1.30E-01 | 0.1 | 2.77E+00 | 4.69E-03 | 4.69E-02 | 1.41E-01 |
| Nickel | 7.04E-02 | ND | 2.25E-01 | 3.13E-02 | 3.13E-01 | 9.39E-01 |

COC = Chemical of concern.
HI = Hazard index
MCL = Maximum contaminant level.
mg/L = milligram per liter
ND = No data
a = US Environmental Protection Agency, *National Primary Drinking Water Regulations*, March 2001, online.

## Table C9-13

## Cancer Risk and Noncancer Hazard Estimates Across All Media
## Parcel 233
## Fort McClellan, Alabama

| Medium | Resident | | Recreational Site User | | Highway Worker | |
|---|---|---|---|---|---|---|
| | HI | ILCR | HI | ILCR | HI | ILCR |
| Surface Soil | NA | NA | NA | NA | NA | NA |
| Groundwater | 3.00E+00 | 8.68E-06 | NA | NA | NA | NA |
| Total Soil | NA | NA | NA | NA | NA | NA |
| **Total HI / ILCR** | **3.00E+00** | **8.68E-06** | **NA** | **NA** | **NA** | **NA** |

HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable

## Table C10-1

## Surface Soil Samples Used in Streamlined Risk Assessment
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| FTA-82-DEP01 | FX0021 | 12-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-DEP02 | FX0022 | 12-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-DEP03 | FX0023 | 12-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-DEP04 | FX0024 | 12-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-DEP05 | FX0025 | 12-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-DEP06 | FX0026 | 8-Mar-1999 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW01 | FX0001 | 10-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW02 | FX0003 | 12-Nov-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW03 | FX0005 | 1-Dec-1998 | 0 - 1 | CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW04 | FX0009 | 16-Nov-1998 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW05 | FX0011 | 16-Nov-1998 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW06 | FX0013 | 9-Dec-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW07 | FX0015 | 9-Dec-1998 | 0 - 1 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-MW08 | FX0019 | 1-Dec-1998 | 0 - 1 | CL Pest, Metals, OP Pest, SVOC, VOC |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds

## Table C10-2

### Selection of Site-Related Chemicals for Surface Soil[a]
### Parcel 82, Stump Dump, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Statistical Distribution | Arithmetic Mean (mg/kg) | Standard Deviation | ln mean | ln std dev | H or t value | 95% UCL (mg/kg) | Background Screening Criterion [b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | |
| Aluminum | 14 / 14 | 100 | 1.31E+03 | 1.76E+04 | 2.19E+01 | 2.65E+01 | L | 5.99E+03 | 4.74E+03 | 8.42E+00 | 7.78E-01 | 2.46E+00 | 1.16E+04 | 1.63E+04 | 2.14E+04 | N (b) |
| Arsenic | 14 / 14 | 100 | 2.60E+00 | 6.70E+00 | 1.10E+00 | 1.30E+00 | N | 4.56E+00 | 1.17E+00 | 1.49E+00 | 2.75E-01 | 1.77E+00 | 5.12E+00 | 1.37E+01 | 2.54E+01 | N (a) |
| Barium | 14 / 14 | 100 | 1.83E+01 | 2.63E+02 | 2.19E+01 | 2.65E+01 | L | 9.63E+01 | 6.95E+01 | 4.35E+00 | 6.89E-01 | 2.33E+00 | 1.79E+02 | 1.24E+02 | 1.94E+02 | Y |
| Beryllium | 9 / 14 | 64 | 3.10E-01 | 2.90E+00 | 5.50E-01 | 6.60E-01 | L | 8.12E-01 | 7.28E-01 | -5.00E-01 | 7.60E-01 | 2.43E+00 | 1.68E+00 | 8.00E-01 | 8.68E-01 | Y |
| Calcium | 4 / 13 | 31 | 4.03E+02 | 5.14E+03 | 5.46E+02 | 6.61E+02 | NP | 7.29E+02 | 1.33E+03 | 6.05E+00 | 8.01E-01 | | 2.38E+03 | 1.72E+03 | 3.54E+03 | N (d) |
| Chromium | 14 / 14 | 100 | 7.20E+00 | 3.60E+01 | 1.10E+00 | 1.30E+00 | N | 1.83E+01 | 9.02E+00 | 2.78E+00 | 5.35E-01 | 1.77E+00 | 2.26E+01 | 3.70E+01 | 6.44E+01 | N (a) |
| Cobalt | 13 / 14 | 93 | 2.50E+00 | 3.19E+01 | 5.50E+00 | 6.60E+00 | L | 1.17E+01 | 9.37E+00 | 2.13E+00 | 8.72E-01 | 2.60E+00 | 2.29E+01 | 1.52E+01 | 3.25E+01 | N (b) |
| Copper | 14 / 14 | 100 | 3.70E+00 | 4.41E+01 | 2.70E+00 | 3.30E+00 | L | 1.54E+01 | 1.05E+01 | 2.54E+00 | 6.67E-01 | 2.30E+00 | 2.80E+01 | 1.27E+01 | 2.25E+01 | Y |
| Iron | 14 / 14 | 100 | 9.24E+03 | 3.91E+04 | 1.09E+01 | 1.32E+01 | N | 2.44E+04 | 8.43E+03 | 1.00E+01 | 4.01E-01 | 1.77E+00 | 2.84E+04 | 3.42E+04 | 5.54E+04 | N (b) |
| Lead | 14 / 14 | 100 | 4.00E+00 | 4.10E+01 | 3.30E-01 | 4.00E-01 | L | 1.45E+01 | 9.54E+00 | 2.51E+00 | 5.89E-01 | 2.20E+00 | 2.59E+01 | 4.01E+01 | 6.38E+01 | N (b) |
| Magnesium | 7 / 14 | 50 | 1.36E+02 | 1.21E+03 | 5.46E+02 | 6.61E+02 | L | 4.50E+02 | 3.29E+02 | 5.90E+00 | 6.46E-01 | 2.27E+00 | 8.42E+02 | 1.03E+03 | 9.60E+03 | N (d) |
| Manganese | 14 / 14 | 100 | 4.41E+01 | 3.00E+03 | 1.60E+00 | 2.00E+00 | L | 6.78E+02 | 7.57E+02 | 6.07E+00 | 1.01E+00 | 2.82E+00 | 1.58E+03 | 1.58E+03 | 4.66E+03 | N (b) |
| Mercury | 6 / 14 | 43 | 1.60E-02 | 2.10E-01 | 3.60E-02 | 4.40E-02 | NP | 4.29E-02 | 5.19E-02 | -3.51E+00 | 7.55E-01 | | 1.05E-01 | 8.00E-02 | 3.22E-01 | N (b) |
| Nickel | 13 / 14 | 93 | 5.60E+00 | 3.76E+01 | 4.40E+00 | 5.30E+00 | L | 1.10E+01 | 8.99E+00 | 2.18E+00 | 6.57E-01 | 2.29E+00 | 2.18E+01 | 1.03E+01 | 2.00E+01 | Y |
| Potassium | 9 / 14 | 64 | 1.40E+02 | 1.35E+03 | 5.46E+02 | 6.61E+02 | L | 5.66E+02 | 3.68E+02 | 6.15E+00 | 6.38E-01 | 2.26E+00 | 1.00E+03 | 8.00E+02 | 6.01E+03 | N (d) |
| Selenium | 5 / 14 | 36 | 6.10E-01 | 1.40E+00 | 5.50E-01 | 6.60E-01 | NP | 4.80E-01 | 3.16E-01 | -8.76E-01 | 5.14E-01 | | 8.57E-01 | 4.80E-01 | 1.28E+00 | Y |
| Silver | 2 / 14 | 14 | 9.20E-01 | 1.10E+00 | 1.10E+00 | 1.30E+00 | NP | 6.51E-01 | 1.58E-01 | -4.50E-01 | 2.01E-01 | | 8.40E-01 | 3.60E-01 | 1.13E+00 | N (b) |
| Thallium | 2 / 14 | 14 | 7.40E-01 | 1.30E+00 | 1.10E+00 | 1.30E+00 | NP | 6.53E-01 | 1.92E-01 | -4.54E-01 | 2.19E-01 | | 8.83E-01 | 3.43E+00 | 4.53E-01 | N (a) |
| Vanadium | 11 / 13 | 85 | 6.60E+00 | 3.43E+01 | 5.50E+00 | 6.60E+00 | N | 1.57E+01 | 9.98E+00 | 2.51E+00 | 8.06E-01 | 1.78E+00 | 2.06E+01 | 5.88E+01 | 9.94E+01 | N (a) |
| Zinc | 14 / 14 | 100 | 9.30E+00 | 1.28E+02 | 2.20E+00 | 2.60E+00 | L | 3.01E+01 | 3.11E+01 | 3.12E+00 | 7.01E-01 | 2.34E+00 | 6.73E+01 | 4.06E+01 | 7.37E+01 | Y |
| **Chlorinated Pesticides** | | | | | | | | | | | | | | | | |
| 4,4'-DDE | 2 / 14 | 14 | 1.10E-03 | 2.50E-03 | 1.90E-03 | 2.10E-02 | NP | 2.28E-03 | 2.61E-03 | -6.42E+00 | 7.45E-01 | | 5.41E-03 | | | Y |
| 4,4'-DDT | 2 / 14 | 14 | 8.60E-04 | 2.20E-03 | 1.90E-03 | 2.10E-02 | NP | 1.98E-03 | 2.53E-03 | -6.56E+00 | 6.87E-01 | | 5.00E-03 | | | Y |
| delta-BHC | 1 / 14 | 7 | 8.10E-04 | 8.10E-04 | 1.90E-03 | 2.10E-02 | NP | 1.88E-03 | 2.55E-03 | -6.62E+00 | 6.86E-01 | | 4.93E-03 | | | Y |
| Heptachlor | 1 / 14 | 7 | 2.30E-03 | 2.30E-03 | 1.90E-03 | 2.10E-02 | NP | 1.99E-03 | 2.53E-03 | -6.55E+00 | 6.84E-01 | | 5.01E-03 | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | | | | | | | |
| Benzo(a)pyrene | 1 / 14 | 7 | 4.00E-02 | 4.00E-02 | 3.60E-01 | 4.40E-01 | NP | 1.85E-01 | 4.28E-02 | -1.75E+00 | 4.27E-01 | | 2.36E-01 | | | Y |
| Benzo(ghi)perylene | 1 / 14 | 7 | 6.30E-02 | 6.30E-02 | 3.60E-01 | 4.40E-01 | NP | 1.86E-01 | 3.69E-02 | -1.71E+00 | 3.07E-01 | | 2.30E-01 | | | Y |
| Phenol | 1 / 14 | 7 | 4.20E-02 | 4.20E-02 | 3.60E-01 | 4.40E-01 | NP | 1.83E-01 | 4.19E-02 | -1.75E+00 | 4.12E-01 | | 2.33E-01 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | | | | | | | |
| Acetone | 8 / 8 | 100 | 7.00E-03 | 5.40E-01 | 2.20E-02 | 2.50E-02 | L | 1.37E-01 | 1.99E-01 | -3.21E+00 | 1.75E+00 | 5.45E+00 | 4.51E-01 | | | Y |
| Bromomethane | 1 / 6 | 17 | 1.40E-03 | 1.40E-03 | 1.10E-02 | 1.20E-02 | NP | 5.07E-03 | 1.81E-03 | -5.39E+00 | 5.81E-01 | | 8.38E-03 | | | Y |
| Cumene | 1 / 14 | 7 | 5.50E-03 | 5.50E-03 | 5.50E-03 | 6.60E-03 | NP | 3.13E-03 | 6.95E-04 | -5.78E+00 | 1.73E-01 | | 3.96E-03 | | | Y |
| Toluene | 3 / 13 | 23 | 2.10E-03 | 3.90E-03 | 5.50E-03 | 6.60E-03 | N | 2.95E-03 | 4.05E-04 | -5.84E+00 | 1.39E-01 | 1.78E+00 | 3.15E-03 | | | Y |
| 2-Butanone | 1 / 1 | 100 | 5.60E-03 | 5.60E-03 | 2.50E-02 | 2.50E-02 | | 5.60E-03 | #DIV/0! | -5.18E+00 | #DIV/0! | | | | | Y |

mg/kg = milligrams per kilogram

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Surface soil is defined as 0 to 2 feet below ground surface.

[b] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C10-3

## Selection of Chemicals of Potential Concern for Surface Soil[a]
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Barium | 2.63E+02 | 5.47E+02 | N | NA | NA | 4.41E+04 | N | NA | NA |
| Beryllium | 2.90E+00 | 9.60E+00 | N | NA | NA | 4.08E+02 | N | NA | NA |
| Copper | 4.41E+01 | 3.13E+02 | N | NA | NA | 2.52E+04 | N | NA | NA |
| Nickel | 3.76E+01 | 1.54E+02 | N | NA | NA | 1.20E+04 | N | NA | NA |
| Selenium | 1.40E+00 | 3.91E+01 | N | NA | NA | 3.15E+03 | N | NA | NA |
| Zinc | 1.28E+02 | 2.34E+03 | N | NA | NA | 1.88E+05 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDE | 2.50E-03 | NA | NA | 1.79E+00 | N | NA | NA | 1.22E+02 | N |
| 4,4'-DDT | 2.20E-03 | 3.83E+00 | N | 1.79E+00 | N | 2.95E+02 | N | 1.22E+02 | N |
| delta-BHC | 8.10E-04 | 2.33E+00 | N | NA | NA | 1.85E+02 | N | NA | NA |
| Heptachlor | 2.30E-03 | 3.88E+00 | N | 1.40E-01 | N | 3.08E+02 | N | 9.58E+00 | N |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Benzo(a)pyrene | 4.00E-02 | NA | NA | 8.51E-02 | N | NA | NA | 5.81E+00 | N |
| Benzo(ghi)perylene | 6.30E-02 | 2.32E+02 | N | NA | NA | 1.82E+04 | N | NA | NA |
| Phenol | 4.20E-02 | 4.66E+03 | N | NA | NA | 3.71E+05 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| Acetone | 5.40E-01 | 7.76E+02 | N | NA | NA | 6.16E+04 | N | NA | NA |
| Bromomethane | 1.40E-03 | 1.09E+01 | N | NA | NA | 8.62E+02 | N | NA | NA |
| Cumene | 5.50E-03 | 7.77E+02 | N | NA | NA | 6.17E+04 | N | NA | NA |
| Toluene | 3.90E-03 | 1.55E+03 | N | NA | NA | 1.24E+05 | N | NA | NA |
| 2-Butanone | 5.60E-03 | 4.66E+03 | N | NA | NA | 3.70E+05 | N | NA | NA |

mg/kg = milligrams per kilogram
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Surface soil is defined as 0 to 2 feet below ground surface.

## Table C10-4

## Surface Water Samples Used in Streamlined Risk Assessment
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| FTA-82-SW/SD01 | FX2001 | 28-Jan-1999 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD02 | FX2002 | 27-Jan-1999 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD03 | FX2003 | 28-Jan-1999 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD04 | FX2004 | 28-Jan-1999 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD06 | FX2006 | 28-Jan-1999 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds

## Table C10-5

## Selection of Site-Related Chemicals for Surface Water
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 5 / 5 | 100 | 3.49E-01 | 6.34E+00 | 2.00E-01 | 2.00E-01 | 3.96E+00 | 5.26E+00 | 1.70E+01 | N (b) |
| Arsenic | 1 / 5 | 20 | 3.60E-03 | 3.60E-03 | 1.00E-02 | 1.00E-02 | 4.72E-03 | 2.17E-03 | 1.05E-02 | N (b) |
| Barium | 5 / 5 | 100 | 1.90E-02 | 6.48E-02 | 2.00E-01 | 2.00E-01 | 3.96E-02 | 7.54E-02 | 1.13E-01 | N (a) |
| Calcium | 5 / 5 | 100 | 1.31E+00 | 1.02E+01 | 5.00E+00 | 5.00E+00 | 4.82E+00 | 2.52E+01 | 6.41E+01 | N (a) |
| Chromium | 3 / 5 | 60 | 5.70E-03 | 6.90E-03 | 1.00E-02 | 1.00E-02 | 5.68E-03 | 1.11E-02 | 1.44E-02 | N (a) |
| Iron | 5 / 5 | 100 | 4.45E-01 | 6.14E+00 | 1.00E-01 | 1.00E-01 | 3.40E+00 | 1.96E+01 | 4.12E+01 | N (a) |
| Lead | 1 / 5 | 20 | 1.90E-03 | 1.90E-03 | 3.00E-03 | 3.00E-03 | 1.58E-03 | 8.67E-03 | 4.73E-02 | N (a) |
| Magnesium | 5 / 5 | 100 | 6.48E-01 | 3.82E+00 | 5.00E+00 | 5.00E+00 | 1.96E+00 | 1.10E+01 | 2.44E+01 | N (a) |
| Manganese | 5 / 5 | 100 | 1.66E-02 | 9.26E-02 | 1.50E-02 | 1.50E-02 | 4.62E-02 | 5.65E-01 | 1.83E+00 | N (a) |
| Potassium | 5 / 5 | 100 | 2.24E+00 | 4.39E+00 | 5.00E+00 | 5.00E+00 | 3.29E+00 | 2.56E+00 | 4.25E+00 | N (d) |
| Vanadium | 3 / 5 | 60 | 8.00E-03 | 1.30E-02 | 5.00E-02 | 5.00E-02 | 1.63E-02 | 1.52E-02 | 3.56E-02 | N (a) |
| Zinc | 2 / 5 | 40 | 1.35E-02 | 1.65E-02 | 2.00E-02 | 2.00E-02 | 1.20E-02 | 4.04E-02 | 1.82E-01 | N (a) |
| **Volatile Organic Compounds** | | | | | | | | | | |
| Acetone | 5 / 5 | 100 | 1.30E-03 | 2.50E-03 | 1.00E-02 | 1.00E-02 | 1.66E-03 | | | Y |

mg/L = milligrams per liter

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C10-6

## Selection of Chemicals of Potential Concern for Surface Water
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Resident | | | | Recreational Site User | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Volatile Organic Compounds** | | | | | | | | | |
| Acetone | 2.50E-03 | 1.57E+00 | N | NA | NA | 1.57E+00 | N | NA | NA |

mg/L = milligrams per liter

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).

COPC = Chemical of potential concern.

N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

[b] Statistical distribution testing performed only for COPC:

N = Normal distribution.

L = Lognormal distribution.

NP = Nonparametric distribution (if data set fails normal and lognormal).

[c] 95% UCL calculated only for COPC with at least 5 samples.

[d] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C10-7

## Sediment Samples Used in Streamlined Risk Assessment
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Depth of sample (ft) | Chemical Analyses Performed |
|---|---|---|---|---|
| FTA-82-SW/SD01 | FX1001 | 28-Jan-1999 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD02 | FX1004 | 28-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD03 | FX1005 | 28-Jan-1999 | 0 - 2 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD04 | FX1006 | 28-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |
| FTA-82-SW/SD06 | FX1008 | 28-Jan-1999 | 0 - 0.5 | CL Herb, CL Pest, Metals, OP Pest, SVOC, VOC |

CL Herb = Chlorinated Herbicides
CL Pest = Chlorinated Pesticides
OP Pest = Organophosphate Pesticides
SVOC = Semivolatile organic compounds
VOC = Volatile organic compounds

## Table C10-8

### Selection of Site-Related Chemicals for Sediment[a]
### Parcel 82, Stump Dump, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/kg) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Statistical Distribution | Arithmetic Mean (mg/kg) | Standard Deviation | ln mean | ln std dev | H or t value | 95% UCL (mg/kg) | Background Screening Criterion[b] (mg/kg) | 95% UTL[c] (mg/kg) | Site-Related?[d] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | | | |
| Aluminum | 5 / 5 | 100 | 2.21E+03 | 1.24E+04 | 2.58E+01 | 3.10E+01 | L | 6.11E+03 | 3.90E+03 | 8.56E+00 | 6.46E-01 | 3.48E+00 | 1.39E+04 | 8.59E+03 | 1.43E+04 | N (b) |
| Arsenic | 5 / 5 | 100 | 2.60E+00 | 5.30E+00 | 1.30E+00 | 1.60E+00 | N | 3.92E+00 | 1.18E+00 | 1.33E+00 | 3.17E-01 | 2.13E+00 | 5.05E+00 | 1.13E+01 | 2.01E+01 | N (a) |
| Barium | 5 / 5 | 100 | 2.80E+01 | 1.15E+02 | 2.58E+01 | 3.10E+01 | N | 7.60E+01 | 3.66E+01 | 4.21E+00 | 5.81E-01 | 2.13E+00 | 1.11E+02 | 9.89E+01 | 1.91E+02 | N (b) |
| Beryllium | 5 / 5 | 100 | 3.70E-01 | 1.00E+00 | 6.50E-01 | 7.80E-01 | L | 6.28E-01 | 2.57E-01 | -5.33E-01 | 4.16E-01 | 2.72E+00 | 1.14E+00 | 9.70E-01 | 1.24E+00 | N (b) |
| Calcium | 5 / 5 | 100 | 1.09E+02 | 2.39E+03 | 6.46E+02 | 7.75E+02 | L | 7.49E+02 | 9.45E+02 | 6.01E+00 | 1.24E+00 | 5.96E+00 | 2.64E+03 | 1.11E+03 | 2.81E+03 | N (d) |
| Chromium | 5 / 5 | 100 | 4.30E+00 | 2.16E+01 | 1.30E+00 | 1.60E+00 | L | 1.17E+01 | 6.25E+00 | 2.34E+00 | 5.77E-01 | 3.24E+00 | 2.42E+01 | 3.12E+01 | 6.33E+01 | N (a) |
| Cobalt | 5 / 5 | 100 | 1.50E+00 | 5.70E+00 | 6.50E+00 | 7.80E+00 | N | 3.66E+00 | 1.69E+00 | 1.20E+00 | 5.26E-01 | 2.13E+00 | 5.27E+00 | 1.10E+01 | 2.19E+01 | N (a) |
| Copper | 5 / 5 | 100 | 4.30E+00 | 4.06E+01 | 3.20E+00 | 3.90E+00 | L | 1.39E+01 | 1.51E+01 | 2.28E+00 | 8.80E-01 | 4.41E+00 | 4.42E+01 | 1.71E+01 | 3.68E+01 | Y |
| Iron | 5 / 5 | 100 | 1.01E+04 | 3.02E+04 | 1.29E+01 | 1.55E+01 | L | 1.90E+04 | 8.08E+03 | 9.78E+00 | 4.45E-01 | 2.81E+00 | 3.52E+04 | 3.53E+04 | 5.19E+04 | N (a) |
| Lead | 5 / 5 | 100 | 4.90E+00 | 1.31E+01 | 3.90E-01 | 4.70E-01 | NP | 1.07E+01 | 3.32E+00 | 2.32E+00 | 4.10E-01 | | 1.74E+01 | 3.78E+01 | 7.64E+01 | N (a) |
| Magnesium | 5 / 5 | 100 | 9.40E+01 | 1.71E+03 | 6.46E+02 | 7.75E+02 | L | 7.44E+02 | 7.59E+02 | 6.02E+00 | 1.30E+00 | 6.26E+00 | 2.26E+03 | 9.06E+02 | 2.20E+03 | N (d) |
| Manganese | 5 / 5 | 100 | 4.33E+01 | 4.93E+02 | 1.90E+00 | 2.30E+00 | N | 2.37E+02 | 1.71E+02 | 5.19E+00 | 9.17E-01 | 2.13E+00 | 4.00E+02 | 7.12E+02 | 2.05E+03 | N (a) |
| Mercury | 5 / 5 | 100 | 1.40E-02 | 3.10E-02 | 4.30E-02 | 5.10E-02 | N | 2.30E-02 | 8.34E-03 | -3.83E+00 | 4.01E-01 | 2.13E+00 | 3.09E-02 | 1.10E-01 | 1.75E-01 | N (a) |
| Nickel | 5 / 5 | 100 | 3.20E+00 | 1.32E+01 | 5.20E+00 | 6.20E+00 | L | 7.24E+00 | 4.07E+00 | 1.84E+00 | 5.95E-01 | 3.30E+00 | 1.54E+01 | 1.30E+01 | 3.16E+01 | N (b) |
| Potassium | 5 / 5 | 100 | 4.18E+02 | 2.29E+03 | 6.46E+02 | 7.75E+02 | NP | 8.80E+02 | 7.92E+02 | 6.55E+00 | 6.78E-01 | | 2.46E+03 | 1.01E+03 | 2.79E+03 | N (d) |
| Selenium | 3 / 5 | 60 | 9.60E-01 | 1.40E+00 | 6.50E-01 | 7.80E-01 | N | 8.23E-01 | 4.79E-01 | -3.68E-01 | 6.96E-01 | 2.13E+00 | 1.28E+00 | 7.20E-01 | 1.88E+00 | N (b) |
| Vanadium | 5 / 5 | 100 | 9.10E+00 | 3.34E+01 | 6.50E+00 | 7.80E+00 | N | 2.07E+01 | 9.15E+00 | 2.94E+00 | 4.94E-01 | 2.13E+00 | 2.94E+01 | 4.09E+01 | 6.67E+01 | N (a) |
| Zinc | 5 / 5 | 100 | 7.00E+00 | 3.54E+01 | 2.60E+00 | 3.10E+00 | N | 1.98E+01 | 1.22E+01 | 2.79E+00 | 7.42E-01 | 2.13E+00 | 3.14E+01 | 5.27E+01 | 1.11E+02 | N (a) |
| **Chlorinated Pesticides** | | | | | | | | | | | | | | | | |
| 4,4'-DDD | 1 / 5 | 20 | 1.00E-03 | 1.00E-03 | 6.60E-03 | 7.90E-03 | NP | 3.03E-03 | 1.16E-03 | -5.90E+00 | 5.68E-01 | | 5.35E-03 | | | Y |
| 4,4'-DDE | 1 / 5 | 20 | 5.40E-03 | 5.40E-03 | 6.60E-03 | 7.90E-03 | L | 3.91E-03 | 8.69E-04 | -5.56E+00 | 2.02E-01 | 2.22E+00 | 5.65E-03 | | | Y |
| 4,4'-DDT | 1 / 5 | 20 | 3.60E-03 | 3.60E-03 | 6.60E-03 | 7.90E-03 | L | 3.55E-03 | 2.50E-04 | -5.64E+00 | 6.89E-02 | 1.98E+00 | 4.05E-03 | | | Y |
| **Semivolatile Organic Compounds** | | | | | | | | | | | | | | | | |
| Anthracene | 1 / 5 | 20 | 8.10E-02 | 8.10E-02 | 4.30E-01 | 5.10E-01 | NP | 1.99E-01 | 6.79E-02 | -1.68E+00 | 4.68E-01 | | 3.35E-01 | | | Y |
| Benzo(a)anthracene | 1 / 5 | 20 | 4.90E-01 | 4.90E-01 | 4.30E-01 | 5.10E-01 | NP | 2.81E-01 | 1.18E-01 | -1.32E+00 | 3.48E-01 | | 5.17E-01 | | | Y |
| Benzo(a)pyrene | 1 / 5 | 20 | 4.90E-01 | 4.90E-01 | 4.30E-01 | 5.10E-01 | NP | 2.81E-01 | 1.18E-01 | -1.32E+00 | 3.48E-01 | | 5.17E-01 | | | Y |
| Benzo(b)fluoranthene | 1 / 5 | 20 | 3.90E-01 | 3.90E-01 | 4.30E-01 | 5.10E-01 | NP | 2.61E-01 | 7.38E-02 | -1.37E+00 | 2.49E-01 | | 4.08E-01 | | | Y |
| Benzo(ghi)perylene | 1 / 5 | 20 | 3.10E-01 | 3.10E-01 | 4.30E-01 | 5.10E-01 | L | 2.45E-01 | 3.95E-02 | -1.42E+00 | 1.52E-01 | 2.10E+00 | 3.24E-01 | | | Y |
| Benzo(k)fluoranthene | 1 / 5 | 20 | 5.10E-01 | 5.10E-01 | 4.30E-01 | 5.10E-01 | NP | 2.85E-01 | 1.27E-01 | -1.32E+00 | 3.66E-01 | | 5.38E-01 | | | Y |
| Carbazole | 1 / 5 | 20 | 7.00E-02 | 7.00E-02 | 4.30E-01 | 5.10E-01 | NP | 1.97E-01 | 7.27E-02 | -1.71E+00 | 5.33E-01 | | 3.42E-01 | | | Y |
| Chrysene | 1 / 5 | 20 | 6.00E-01 | 6.00E-01 | 4.30E-01 | 5.10E-01 | NP | 3.03E-01 | 1.67E-01 | -1.28E+00 | 4.37E-01 | | 6.36E-01 | | | Y |
| Dibenz(a,h)anthracene | 1 / 5 | 20 | 1.10E-01 | 1.10E-01 | 4.30E-01 | 5.10E-01 | N | 2.05E-01 | 5.53E-02 | -1.62E+00 | 3.33E-01 | 2.13E+00 | 2.58E-01 | | | Y |
| Fluoranthene | 1 / 5 | 20 | 1.40E+00 | 1.40E+00 | 4.30E-01 | 5.10E-01 | NP | 4.63E-01 | 5.24E-01 | -1.11E+00 | 8.14E-01 | | 1.51E+00 | | | Y |
| Indeno(1,2,3-cd)pyrene | 1 / 5 | 20 | 2.60E-01 | 2.60E-01 | 4.30E-01 | 5.10E-01 | L | 2.35E-01 | 2.09E-02 | -1.45E+00 | 8.80E-02 | 2.02E+00 | 2.77E-01 | | | Y |
| Phenanthrene | 1 / 5 | 20 | 6.10E-01 | 6.10E-01 | 4.30E-01 | 5.10E-01 | NP | 3.05E-01 | 1.71E-01 | -1.28E+00 | 4.45E-01 | | 6.47E-01 | | | Y |
| Pyrene | 1 / 5 | 20 | 1.20E+00 | 1.20E+00 | 4.30E-01 | 5.10E-01 | NP | 4.23E-01 | 4.35E-01 | -1.15E+00 | 7.45E-01 | | 1.29E+00 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | | | | | | | |
| Trichlorofluoromethane | 4 / 5 | 80 | 3.90E-03 | 6.90E-03 | 1.30E-02 | 1.60E-02 | L | 5.18E-03 | 1.41E-03 | -5.29E+00 | 2.65E-01 | 2.37E+00 | 7.99E-03 | | | Y |

mg/kg = milligrams per kilogram

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related. mg/kg = Milligrams per kilogram

[a] Sediment is defined as soil from 0 to 2 feet below ground surface.

[b] Background screening criterion for metals is 2 times the mean background concentration
*(Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[c] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[d] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.
N (b) = maximum detected concentration does not exceed the upper tolerance limit.
N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.
N (d) = essential nutrient.
N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C10-9

## Selection of Chemicals of Potential Concern for Sediment[a]
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/kg) | Applicable SSSL (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreational Site User | | | | Resident | | | |
| | | Noncancer | COPC? | Cancer | COPC? | Noncancer | COPC? | Cancer | COPC? |
| **Metals** | | | | | | | | | |
| Copper | 4.06E+01 | 4.74E+04 | N | NA | NA | 4.74E+04 | N | NA | NA |
| **Chlorinated Pesticides** | | | | | | | | | |
| 4,4'-DDD | 1.00E-03 | NA | NA | 2.35E+02 | N | NA | NA | 2.35E+02 | N |
| 4,4'-DDE | 5.40E-03 | NA | NA | 1.66E+02 | N | NA | NA | 1.66E+02 | N |
| 4,4'-DDT | 3.60E-03 | 4.03E+02 | N | 1.66E+02 | N | 4.03E+02 | N | 1.66E+02 | N |
| **Semivolatile Organic Compounds** | | | | | | | | | |
| Anthracene | 8.10E-02 | 2.99E+05 | N | NA | NA | 2.99E+05 | N | NA | NA |
| Benzo(a)anthracene | 4.90E-01 | NA | NA | 8.93E+01 | N | NA | NA | 8.93E+01 | N |
| Benzo(a)pyrene | 4.90E-01 | NA | NA | 8.93E+00 | N | NA | NA | 8.93E+00 | N |
| Benzo(b)fluoranthene | 3.90E-01 | NA | NA | 8.93E+01 | N | NA | NA | 8.93E+01 | N |
| Benzo(ghi)perylene | 3.10E-01 | 2.79E+04 | N | NA | NA | 2.79E+04 | N | NA | NA |
| Benzo(k)fluoranthene | 5.10E-01 | NA | NA | 8.93E+02 | N | NA | NA | 8.93E+02 | N |
| Carbazole | 7.00E-02 | NA | NA | 3.26E+03 | N | NA | NA | 3.26E+03 | N |
| Chrysene | 6.00E-01 | NA | NA | 9.79E+03 | N | NA | NA | 9.79E+03 | N |
| Dibenz(a,h)anthracene | 1.10E-01 | NA | NA | 9.79E+00 | N | NA | NA | 9.79E+00 | N |
| Fluoranthene | 1.40E+00 | 3.73E+04 | N | NA | NA | 3.73E+04 | N | NA | NA |
| Indeno(1,2,3-cd)pyrene | 2.60E-01 | NA | NA | 8.93E+01 | N | NA | NA | 8.93E+01 | N |
| Phenanthrene | 6.10E-01 | 2.79E+05 | N | NA | NA | 2.79E+05 | N | NA | NA |
| Pyrene | 1.20E+00 | 3.06E+04 | N | NA | NA | 3.06E+04 | N | NA | NA |
| **Volatile Organic Compounds** | | | | | | | | | |
| Trichlorofluoromethane | 6.90E-03 | 3.06E+05 | N | NA | NA | 3.06E+05 | N | NA | NA |

mg/kg = milligrams per kilogram

SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).

COPC = Chemical of potential concern

N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.

[a] Sediment is defined from 0 to 2 feet below ground surface.

## Table C10-10

## Groundwater Samples Used in Streamlined Risk Assessment
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Sample Location | Sample Number | Sample Date | Chemical Analyses Performed |
|---|---|---|---|
| FTA-82-MW01 | FX3001 | 5-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW02 | FX3002 | 6-Jan-1999 | CL Herb, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW03 | FX3003 | 6-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW04 | FX3006 | 8-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW05 | FX3007 | 11-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW06 | FX3008 | 11-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW07 | FX3009 | 12-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |
| FTA-82-MW08 | FX3010 | 6-Jan-1999 | CL Herb, CL Pest, OP Pest, Metals, SVOCs, VOCs |

SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds
CL Herb - Chlorinated herbicides
CL Pest - Chlorinated pesticides
OP Pest - Organophosphate pesticides

## Table C10-11

## Selection of Site-Related Chemicals for Groundwater
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Chemical | Detection Frequency | Percent hits | Range of values (mg/L) Detected Concentration Minimum | Detected Concentration Maximum | Reporting Limits Minimum | Reporting Limits Maximum | Arithmetic Mean (mg/L) | Background Screening Criterion [a] (mg/L) | 95% UTL[b] (mg/L) | Site-Related?[c] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | |
| Aluminum | 8 / 8 | 100 | 3.24E-02 | 2.58E+00 | 2.00E-01 | 2.00E-01 | 8.56E-01 | 2.34E+00 | 9.60E+00 | N (b) |
| Barium | 8 / 8 | 100 | 7.90E-03 | 1.69E-01 | 2.00E-01 | 2.00E-01 | 5.46E-02 | 1.27E-01 | 4.72E-01 | N (b) |
| Calcium | 8 / 8 | 100 | 1.35E-01 | 5.23E+00 | 5.00E+00 | 5.00E+00 | 1.40E+00 | 5.65E+01 | 4.52E+02 | N (a) |
| Chromium | 4 / 4 | 100 | 4.40E-03 | 1.21E-02 | 1.00E-02 | 1.00E-02 | 6.63E-03 | | | Y |
| Cobalt | 2 / 8 | 25 | 7.90E-03 | 1.27E-02 | 5.00E-02 | 5.00E-02 | 2.13E-02 | 2.34E-02 | 2.52E+02 | N (a) |
| Copper | 4 / 8 | 50 | 3.80E-03 | 6.40E-03 | 2.50E-02 | 2.50E-02 | 8.53E-03 | 2.55E-02 | 2.35E-01 | N (a) |
| Iron | 7 / 8 | 88 | 3.50E-01 | 1.03E+01 | 1.00E-01 | 1.00E-01 | 1.96E+00 | 7.04E+00 | 2.58E+01 | N (b) |
| Lead | 1 / 8 | 13 | 8.40E-03 | 8.40E-03 | 3.00E-03 | 3.00E-03 | 2.36E-03 | 8.00E-03 | 2.58E-02 | N (b) |
| Magnesium | 8 / 8 | 100 | 2.93E-01 | 2.30E+00 | 5.00E+00 | 5.00E+00 | 8.67E-01 | 2.13E+01 | 1.49E+02 | N (a) |
| Manganese | 8 / 8 | 100 | 1.71E-02 | 1.83E+00 | 1.50E-02 | 1.50E-02 | 5.10E-01 | 5.81E-01 | 4.13E+00 | N (b) |
| Nickel | 4 / 8 | 50 | 9.90E-03 | 2.42E-02 | 4.00E-02 | 4.00E-02 | 1.71E-02 | | | Y |
| Sodium | 8 / 8 | 100 | 6.01E-01 | 1.23E+00 | 5.00E+00 | 5.00E+00 | 9.08E-01 | 1.48E+01 | 4.90E+01 | N (a) |
| **Semivolatile Organic Compounds** | | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 1 / 8 | 13 | 1.10E-03 | 1.10E-03 | 1.00E-02 | 1.00E-02 | 4.51E-03 | | | Y |
| **Volatile Organic Compounds** | | | | | | | | | | |
| 1,2-Dimethylbenzene | 1 / 8 | 13 | 2.00E-04 | 2.00E-04 | 1.00E-03 | 1.00E-03 | 4.63E-04 | | | Y |
| Acetone | 3 / 3 | 100 | 2.60E-03 | 9.30E-02 | 1.00E-02 | 2.00E-02 | 4.25E-02 | | | Y |
| Benzene | 1 / 8 | 13 | 2.10E-04 | 2.10E-04 | 1.00E-03 | 1.00E-03 | 4.64E-04 | | | Y |
| Chloromethane | 1 / 6 | 17 | 3.60E-04 | 3.60E-04 | 2.00E-03 | 2.00E-03 | 8.93E-04 | | | Y |
| Ethylbenzene | 1 / 8 | 13 | 4.40E-04 | 4.40E-04 | 1.00E-03 | 1.00E-03 | 4.93E-04 | | | Y |
| m,p-Xylenes | 1 / 8 | 13 | 1.60E-03 | 1.60E-03 | 1.00E-03 | 1.00E-03 | 6.38E-04 | | | Y |
| Toluene | 1 / 8 | 13 | 1.10E-02 | 1.10E-02 | 1.00E-03 | 1.00E-03 | 1.81E-03 | | | Y |

mg/L = milligrams per liter

N = Chemical is determined not to be site-related ; Y = Chemical is determined to be site-related.

[a] Background criterion for inorganic constituents is 2 times the mean background concentration (*Science Applications International Corporation, 1998, Background Metals Survey Report, Fort McClellan*, Anniston, Alabama, July).

[b] 95% Upper Tolerance Limit (UTL) based on statistical distribution of background metal data.

[c] Rationale for exclusion of a chemical as site-related:

N (a) = maximum detected concentration does not exceed background screening criterion.

N (b) = maximum detected concentration does not exceed the upper tolerance limit.

N (c) = detection frequency is less than 5 percent, detected only at low concentrations, and not expected to be site-related based on historical information.

N (d) = essential nutrient.

N (e) = site data set and background data set are drawn from the same population as determined by statistical testing.

## Table C10-12

## Selection of Chemicals of Potential Concern for Groundwater
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| Site-Related Chemical | Maximum Detected Concentration (mg/L) | Applicable SSSL (mg/L) Resident Noncancer | COPC? | Cancer | COPC? | Statistical Distribution [a] | 95% UCL [b] (mg/L) | Source-Term Concentration [c] (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | |
| Chromium | 1.21E-02 | 4.69E-03 | Y | NA | NA | NA | NA | 1.21E-02 |
| Nickel | 2.42E-02 | 3.13E-02 | N | NA | NA | | | |
| **Semivolatile Organic Compounds** | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 1.10E-03 | 2.85E-02 | N | 4.31E-03 | N | | | |
| **Volatile Organic Compounds** | | | | | | | | |
| 1,2-Dimethylbenzene | 2.00E-04 | 2.80E+00 | N | NA | NA | | | |
| Acetone | 9.30E-02 | 1.56E-01 | N | NA | NA | | | |
| Benzene | 2.10E-04 | 3.96E-03 | N | 1.41E-03 | N | | | |
| Chloromethane | 3.60E-04 | 6.22E-03 | N | 3.93E-03 | N | | | |
| Ethylbenzene | 4.40E-04 | 1.40E-01 | N | NA | NA | | | |
| m,p-Xylenes | 1.60E-03 | 2.80E+00 | N | NA | NA | | | |
| Toluene | 1.10E-02 | 2.59E-01 | N | NA | NA | | | |

mg/L = milligrams per liter
SSSL = Site-specific screening level developed as described in the *Human Health & Ecological Screening Values & PAH Background Summary Report* (IT, August 2000).
COPC = Chemical of potential concern.
UCL = Upper confidence limit.
N = Chemical is determined not to be a COPC ; Y = Chemical is determined to be COPC.
[a] Statistical distribution testing performed only for COPC:
N = Normal distribution.
L = Lognormal distribution.
NP = Nonparametric distribution (if data set fails normal and lognormal).
[b] 95% UCL calculated only for COPC with at least 5 samples.
[c] The 95% UCL or maximum concentration, whichever is lower, is selected as the source-term concentration.

## Table C10-13

## Cancer Risk and Noncancer Hazard Estimates for Resident Exposed to Groundwater
## Parcel 82, Stump Dump, Fort McClellan, Alabama

| COPC | Source-Term Concentration (mg/L) | Total Noncancer Hazard / Cancer Risk Resident HI | ILCR |
|---|---|---|---|
| **Metals** | | | |
| Chromium | 1.21E-02 | 2.58E-01 | NA |
| **Total HI / ILCR** | | 2.58E-01 | NA |

COPC = Chemical of potential concern
HI = Hazard index
ILCR = Incremental lifetime cancer risk
NA = Not applicable
mg/L = milligrams per liter